



Evolving Cost-Effectiveness Thresholds for Decision-Making at NICE: Changes in the Base Threshold and Use of Higher Thresholds in Special Cases

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Background

- An incremental cost-effectiveness ratio (ICER) represents the additional cost required to gain one additional unit of health benefit, most commonly cost per quality-adjusted life year (QALY) gained when comparing a new intervention with standard care. ICERs are a core component of health technology assessment (HTA), with many agencies applying explicit or implicit cost-effectiveness thresholds to inform reimbursement and coverage decisions.^{1,2}
- In England, the National Institute for Health and Care Excellence (NICE) uses cost-utility analysis (ICERs in £/QALY) to inform recommendations for National Health Service (NHS) funding under a fixed budget, where adopting a new technology may displace other NHS activities (opportunity cost).^{1,3,4}
- Rather than a single threshold, NICE has historically applied a range of £20,000–£30,000 per QALY, with an “increasingly strong justification” required as ICERs exceed the upper bound.^{3,5}
- Because the base range remained nominally stable for many years, inflation implies a real-terms tightening of the cost-effectiveness threshold for routine appraisals over time.
- Concurrently, NICE policy has evolved to permit higher effective thresholds in selected contexts, contributing to a tiered threshold landscape, including:
 - End-of-life (EoL):** supplementary advice 2009 enabled additional weight to be placed on life-extending benefits for eligible terminal conditions.⁶
 - The severity modifier** (formalized in NICE’s 2022 Health Technology Evaluations manual) applies additional weight to QALYs when conditions involve greater lifetime health loss, potentially supporting higher “effective” ICERs.⁷
 - Highly Specialized Technologies (HST)** evaluations for ultra-rare diseases operate under a distinct appraisal context and have historically been associated with substantially higher ICER levels than routine STAs.⁷
- Recent Development:** NICE has confirmed an increase in the standard threshold range to £25,000–£35,000 per QALY as of April 2026, following a regulatory change that gives ministers limited power to set the standard threshold.^{8,9} This marks the first revision since the inception of its technology appraisal program in 1999, reflecting an important shift in the cost-effectiveness benchmark used for decision-making.

Objective

- To quantify the real-terms erosion of NICE’s base £20,000–£30,000/QALY threshold over time using inflation adjustment, and present counterfactual “implied thresholds” indexed to real per-capita NHS expenditure growth.
- To characterize effective ICER ranges observed in NICE decisions (2015–2025) by appraisal context, comparing:
 - routine **Single Technology Appraisals (STAs)**,
 - HST evaluations**, and
 - appraisals involving **severity modifier proposals and end-of-life criteria**.

Methods

Real-terms erosion of NICE’s standard cost-effectiveness threshold, 2015–2025

- Base threshold:** NICE’s standard cost-effectiveness range of £20,000–£30,000 per QALY was treated as nominally constant over the study window (2015–2025).
- Inflation data:** Annual CPI (Consumer Price Index) all-items index values from the United Kingdom (UK) Office for National Statistics (ONS) (series D7BT; 2015 = 100) were used.¹⁰
- Inflation adjustment (2015 base):** For each year t (2015–2025), the real value of the threshold in constant 2015 pounds was calculated:

$$\text{Real Threshold}_{2015\text{£}}^t = \text{Nominal Threshold} \times \frac{CPI_{2015}}{CPI_t}$$

- Alternative base year (1999):** Because the NICE threshold was first used in 1999, the same nominal £20k–£30k range was also expressed in constant 1999 pounds, rebasing CPI to 1999:

$$\text{Real Threshold}_{1999\text{£}}^t = \text{Nominal Threshold} \times \frac{CPI_{1999}}{CPI_t}$$

- Presentation:** Solid lines show 2015-base real values; dashed lines show 1999-base real values (both shown over 2015–2025).

Implied NICE threshold indexed to real per-capita NHS expenditure growth (2015–2025)

- NHS expenditure series:** Nominal NHS expenditure for the UK was extracted from the House of Commons Library NHS expenditure tables (CBP0724/SN00724 accompanying tables).¹¹
- Inflation adjustment:** Nominal NHS expenditure was converted to real terms using ONS annual CPI all-items (2015 = 100; series D7BT).¹⁰
- Population denominator:** UK population was obtained from ONS annual mid-year population estimates (series UKPOP).¹²
- Real per-capita NHS expenditure:** For each year t , real per-capita NHS expenditure was calculated as:

$$\text{Real NHS spend per capita}_t = \frac{\text{Nominal NHS spend}_t \times (CPI_{2015}/CPI_t)}{\text{Population}_t}$$
- Growth indexing:** Year-to-year growth in real per-capita NHS expenditure was calculated and used as an index to scale NICE’s nominal base threshold range (£20,000–£30,000/QALY).
- Implied thresholds (two baselines):**
 - 2015 baseline (solid lines):** Starting from £20,000–£30,000/QALY in 2015, the threshold bounds were multiplied by the cumulative growth in real per-capita NHS expenditure from 2015 to year t .
 - 1999 baseline (dashed lines):** Starting from the same nominal £20,000–£30,000/QALY in 1999, bounds were multiplied by cumulative growth in real per-capita NHS expenditure from 1999 to year t .

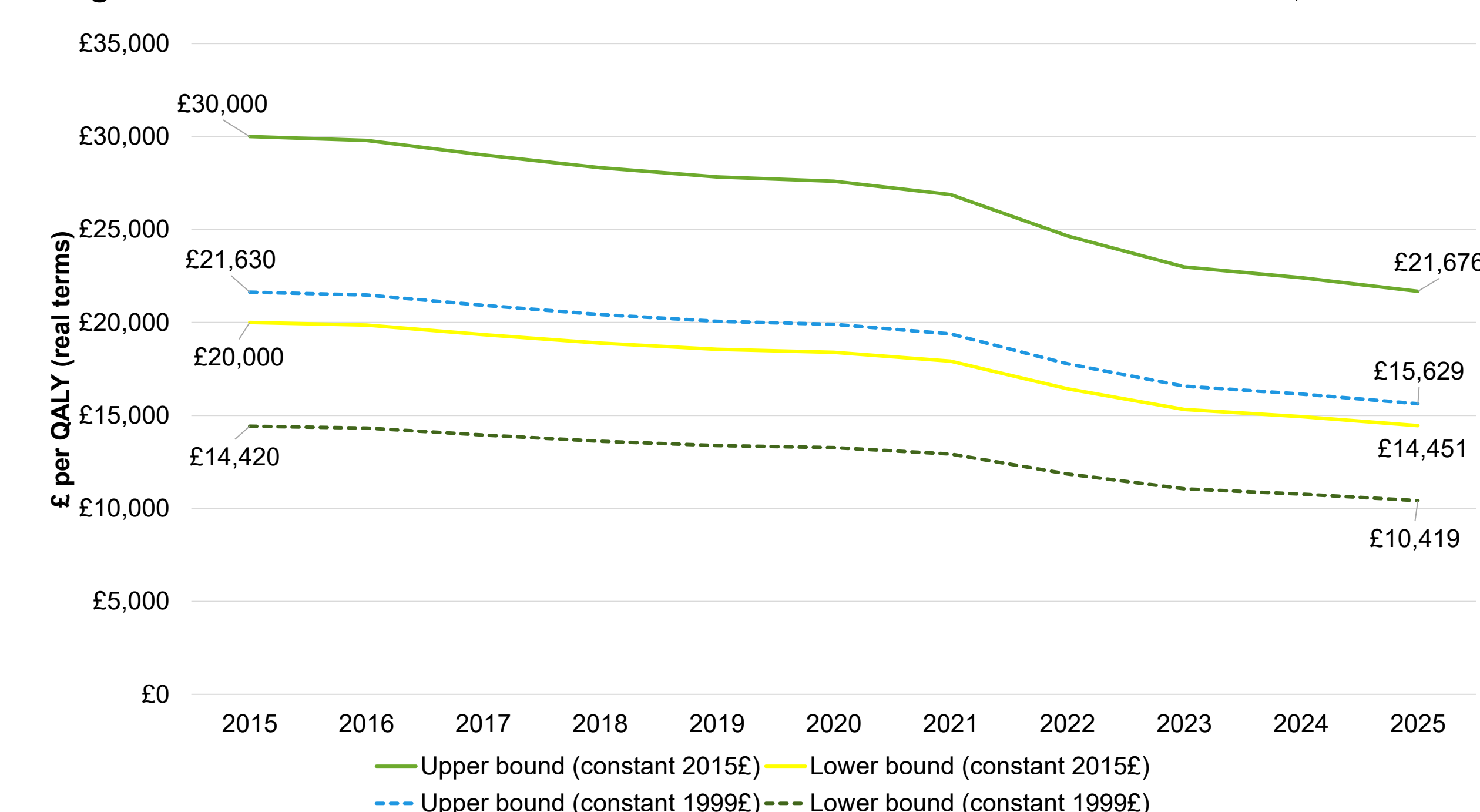
Methods (continued)

Illustrative ICER review

- Data sources & scope:**
 - All NICE STAs¹³ and HST evaluations¹⁴ published between 2015–2025 were identified via the NICE website; appraisals that were terminated, or appraisals that represented updates to guidance originally published outside this period, were excluded.
 - A random sample of 55 STAs (5 per year) was drawn using simple random sampling within each calendar year, with no further stratification applied; sample size was determined pragmatically to provide a cross-sectional snapshot within the constraints of single-reviewer extraction.
 - All HST evaluations published during the same period were included in full.
- ICER extraction:**
 - Committee-preferred ICERs were extracted where explicitly reported in the final guidance. Where a precise ICER was not stated, values were inferred from committee language: reported ranges were plotted at the midpoint; one-sided bounds (e.g., >£30,000) were plotted at the stated value; and qualitative confirmations of threshold position (e.g., ‘within the acceptable range’) were assigned the midpoint of the corresponding threshold range for plotting purposes.
 - Where a single appraisal contained multiple decisions relevant to the final recommendation (e.g., an overall population ICER not accepted alongside an accepted subgroup ICER), each was extracted as a separate decision.
- Modifier & route classification:** For each extracted decision, application of the following was recorded: end-of-life criteria, severity modifier, and HST category.
- Exclusions:** Appraisals reporting cost-consequence or cost-comparison analyses only, with no ICER discussed by the committee, were excluded.

Results

Figure 1: Real-terms erosion of NICE’s standard cost-effectiveness threshold, 2015–2025

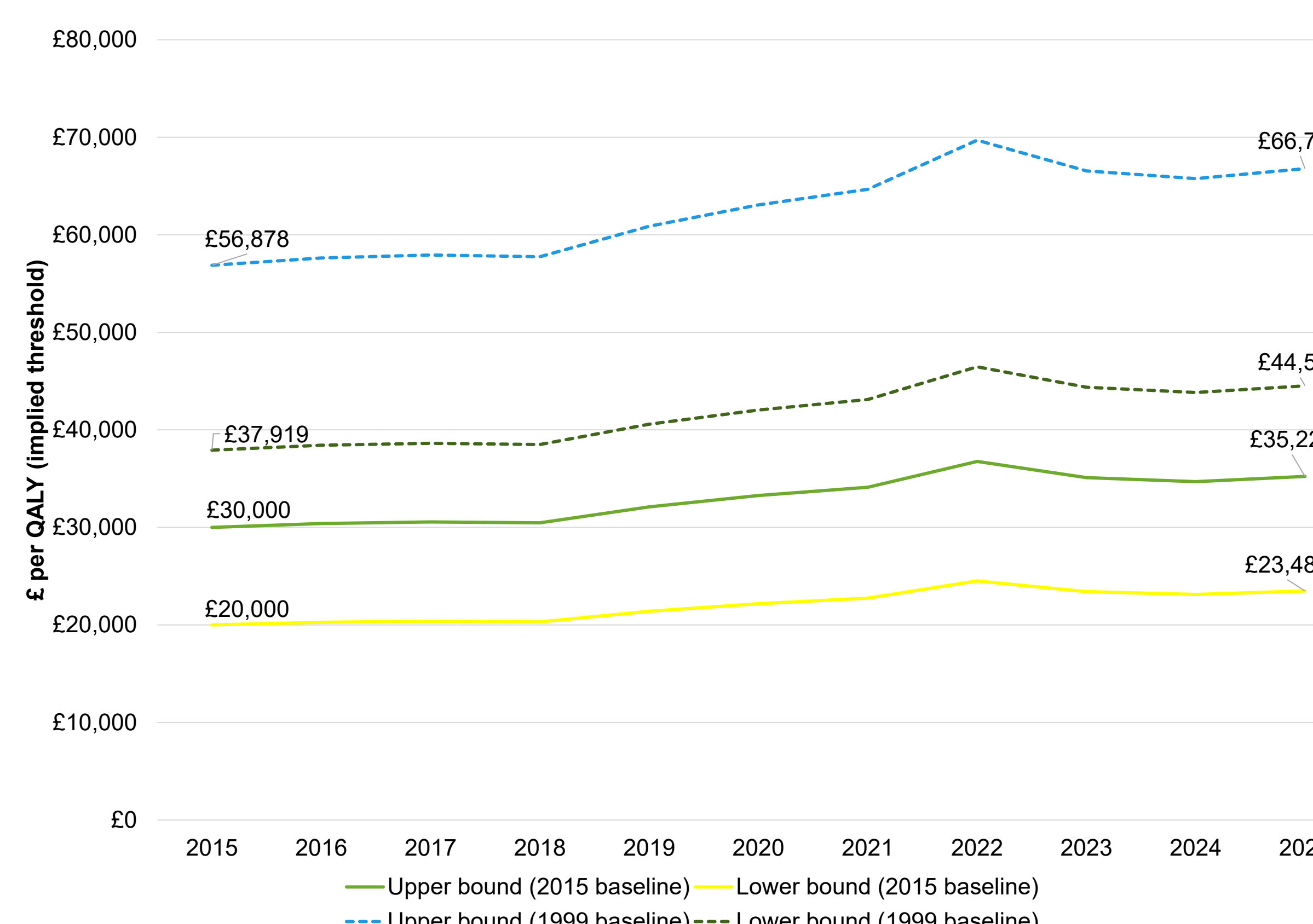


The nominal NICE range (£20,000–£30,000 per QALY) is expressed in real terms using ONS annual CPI (all items; series D7BT). Solid lines show values in constant 2015 pounds; dashed lines show values in constant 1999 pounds (1999 reflects the start of NICE technology appraisals). Values decline sharply after 2021, indicating substantial inflation-driven tightening in the real value of the benchmark. (Source: ONS CPI D7BT)

- Real-terms erosion is substantial.** Adjusting for inflation, NICE’s nominal £20,000–£30,000/QALY range tightened materially in real terms between 2015 and 2025 (Figure 1).
 - Magnitude of erosion (2015 base):** In constant 2015 pounds, the upper bound declines from £30,000 (2015) to £21,676 (2025) and the lower bound from £20,000 (2015) to £15,629 (2025) – a **~28% reduction** in real value across both bounds.
 - Consistent pattern using 1999 as baseline:** When expressed in constant 1999 pounds, the same tightening is observed over 2015–2025 (upper bound: £21,630 → £15,629; lower bound: £14,420 → £10,419), again implying a **~28% real-terms decline**.
 - Timing:** The steepest reductions occur around 2021–2023, aligning with the period of elevated inflation captured in the annual CPI series.
 - Interpretation:** With a fixed nominal threshold, inflation reduces its purchasing power, so the effective £/QALY benchmark declines over time for routine appraisals.
- Indexing NICE’s base range to real per-capita NHS expenditure growth** implies a higher “budget-consistent” benchmark than the static nominal £20,000–£30,000/QALY range (Figure 2).
 - Magnitude of change vs nominal (2015 → 2025):** Under the 2015 baseline (solid lines), the implied threshold rises from £20,000–£30,000 (2015) to £23,482–£35,223 (2025) – an **increase of ~17%** in both bounds.
 - Same growth signal using 1999 baseline:** Over the same 2015–2025 window, the 1999-baseline series also **increases by ~17%** (from £17,919–£26,878 in 2015 to £21,630–£33,223 in 2025), showing that the 2015–2025 growth in real per-capita NHS expenditure is consistent regardless of the baseline year chosen.
 - Level difference (long-run baseline):** Because the 1999 baseline accumulates a longer period of spending growth, the implied 2025 threshold is **~2.2x** the nominal base range (i.e., £44,521–£66,782 vs £20,000–£30,000, ~+123%).
 - The implied threshold increases most strongly up to ~2022, then stabilizes slightly through 2023–2025, consistent with the trajectory of real per-capita NHS spending in the period.
 - Interpretation:** If the NICE base threshold had tracked real per-capita NHS expenditure, the “value-for-money” benchmark would have increased by **~17%** from 2015 to 2025.

Results (continued)

Figure 2: Implied NICE threshold indexed to real per-capita NHS expenditure growth, 2015–2025

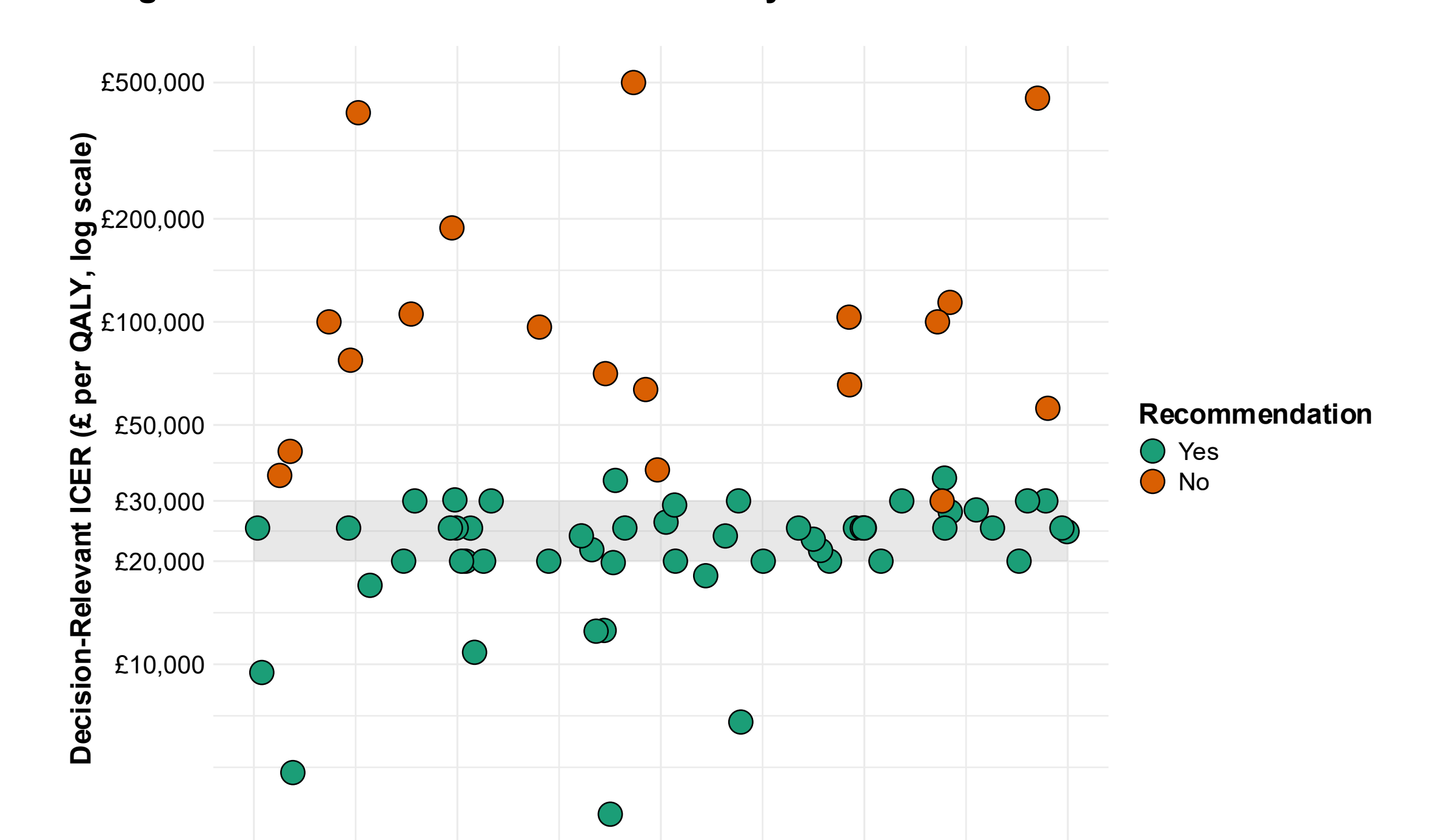


Nominal NHS expenditure was converted to real terms using ONS annual CPI (D7BT) and divided by ONS mid-year UK population (UKPOP) to obtain real per-capita NHS expenditure. The growth index was applied to NICE’s nominal £20,000–£30,000/QALY range to illustrate implied threshold bounds under 2015 (solid) and 1999 (dashed) baselines.

Illustrative ICER review

- To complement the erosion and spend-indexed benchmarks (Figures 1–2), committee-preferred ICERs were summarized by appraisal route to illustrate “effective” thresholds in practice (2015–2025).
- This section addresses Objective 2 by comparing observed ICERs and recommendation outcomes across routine STAs, STAs invoking end-of-life/severity considerations, and HST evaluations (Figures 3–5).

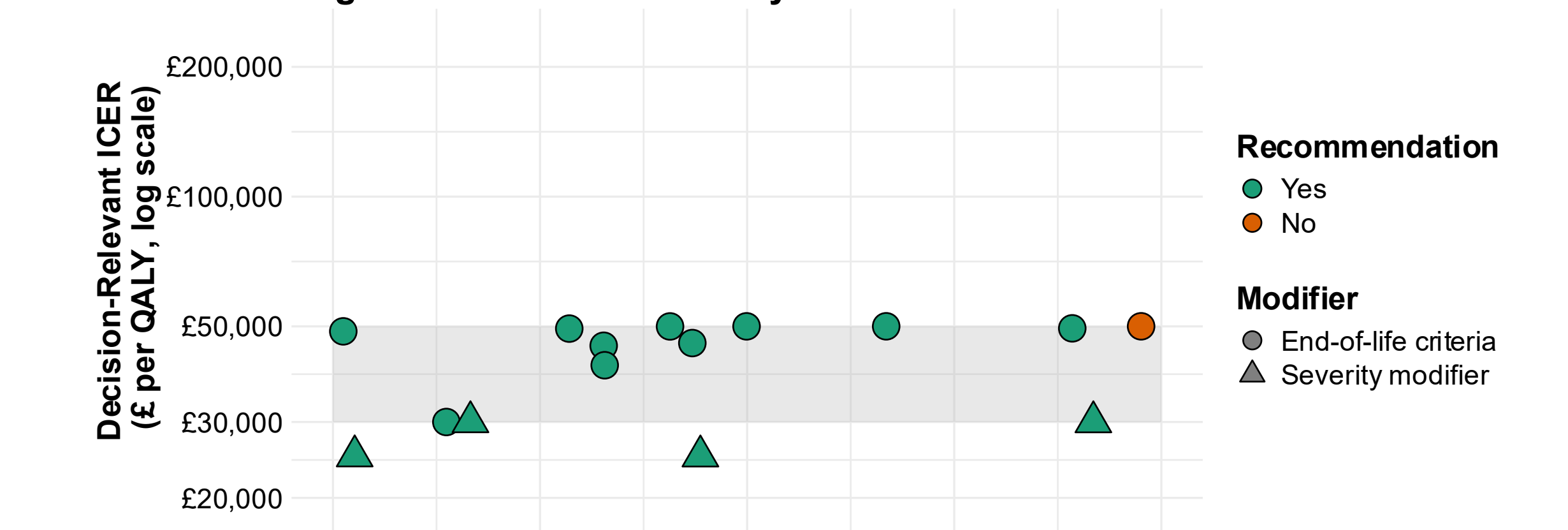
Figure 3: Standard STAs without severity modifier or end-of-life criteria



Points represent decision-relevant ICERs. Where ICERs were reported as ranges, midpoints were used; where reported as inequality bounds (e.g., <£20,000 or >£100,000), the corresponding upper or lower bound was plotted. The shaded area indicates the NICE reference range (£20,000–£30,000 per QALY).

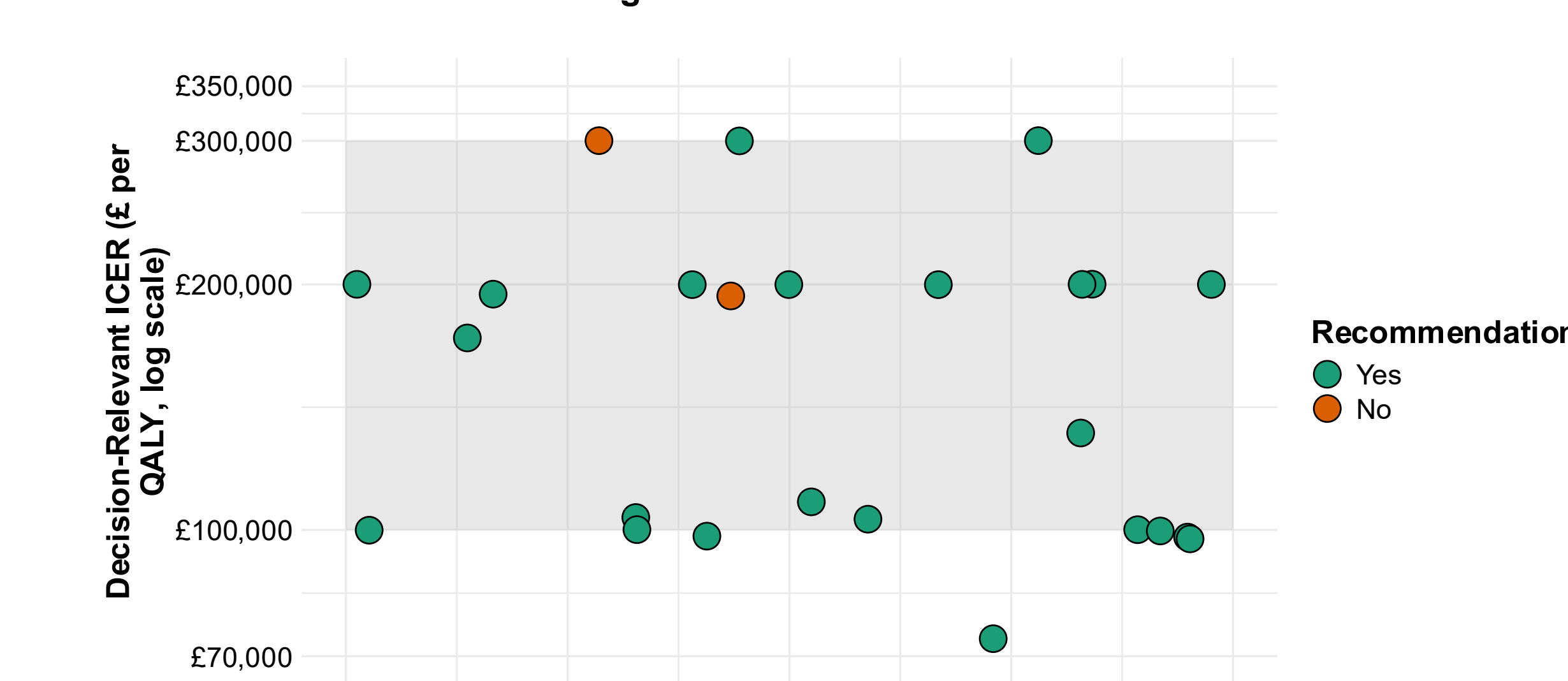
- STAs (routine route):** 55 sampled; 5 excluded → 50 STAs contributing 76 decision-relevant ICERs (56 recommended, 20 not recommended).
- Recommended decisions clustered within or just below the base cost-effectiveness threshold (£20k–£30k/QALY), consistent with the standard STA benchmark; 4 decisions were dominant (cost-saving).
- Not recommended decisions were generally associated with ICERs above the base range, typically >£30k/QALY (~£35k–£45k/QALY), suggesting limited value for money under routine criteria.
- One extreme outlier (~£4M/QALY) was excluded from the plot for scaling/visual clarity.
- STAs with severity modifier or end-of-life criteria:** 15 decisions (EoL n=11; severity n=4) were identified; 14 were recommended and 1 was not recommended.
- Recommended decisions generally fell in the ~£30k–£50k/QALY range, consistent with a higher “effective” acceptance range when end-of-life criteria or severity considerations are invoked.
- The single non-recommended decision had an ICER >£50k/QALY despite meeting end-of-life criteria, suggesting an upper limit to acceptance even under modifier-related considerations.

Figure 4: STAs with severity modifier or end-of-life criteria



Points represent decision-relevant ICERs. Where ICERs were reported as ranges, midpoints were used; where reported as inequality bounds (e.g., <£50,000 or >£50,000), the corresponding upper or lower bound was plotted. The shaded area indicates the NICE reference range (£30,000–£50,000 per QALY). The non-recommended decision corresponds to an ICER of >£50,000. Shape indicates modifier type; colour indicates recommendation status.

Figure 5: HST evaluations



Points represent decision-relevant ICERs. Where ICERs were reported as ranges, midpoints were used; where reported as inequality bounds (e.g., <£100,000 or >£300,000), the corresponding upper or lower bound was plotted. The shaded area indicates the NICE reference range (£100,000–£300,000 per QALY).

- HST sample:** 28 evaluations identified; 3 excluded → 25 evaluations yielding 26 decisions (24 recommended, 2 not recommended).
- Recommended decisions** covered a substantially higher ICER range than routine STAs, spanning ~£60k–£300k/QALY (1 dominant), consistent with the distinct HST appraisal context for ultra-rare conditions.
- Not recommended decisions** typically involved ICERs >£300k/QALY, or ~£130k–£250k/QALY even under optimistic assumptions where committees noted substantial uncertainty.
- One recommended decision likely exceeded ~£300k/QALY, with the committee citing plausible uncaptured benefits, illustrating the role of deliberative judgement within the HST framework.

Conclusions

- Between 2015 and 2025, NICE’s nominal £20,000–£30,000/QALY range fell by **~28% in real terms**, implying a progressively tighter value-for-money benchmark for routine appraisals.
- Over the same period, a counterfactual benchmark indexed to **real per-capita NHS expenditure** would have **increased by ~17%** (2015 baseline), indicating that the trend implied by NHS spending growth is the opposite of the inflation-adjusted erosion.
- The **observed decision evidence** from NICE appraisals is consistent with this divergence: **routine STA decisions** largely cluster around the long-standing base range, while higher effective ICERs are accepted selectively through **end-of-life/severity** considerations and through the **HST route** (often up to ~£300k/QALY).
- Taken together, these findings suggest that from 2015–2025 NICE operated a **de facto tiered threshold system**: a tightening base benchmark in real terms, alongside explicit pathways that allow higher effective thresholds in specific contexts (severity, end-of-life, ultra-rare disease).

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Acknowledgements

All authors report employment with Evidinno Outcomes Research Inc.

