The impact of inflation on incremental costs in HTA

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Key Messages

- NHS background healthcare costs, those incurred in treating patients beyond the price of medicine itself, rise over time due to inflation. This pushes up the overall cost of providing new treatments when assessed by health technology appraisal bodies, even when the treatment's own price has not changed.
- When the cost-effectiveness threshold, the maximum a health system will pay per additional unit of health benefit, remains fixed, treatments launched in later years appear progressively less cost-effective, not because they have changed, but because the world around them has. Rising background NHS costs progressively erode the cost-effectiveness of a given medicine in later launch years.
- The effect is most pronounced for treatments that extend patients' lives, since additional life-years mean more accumulated background healthcare costs. This creates a systematic bias against the types of innovation that deliver the greatest survival gains: life-extending treatments and those used in high-cost care settings. Treatments that save costs or do not extend life are largely unaffected.

Executive summary

Inflation reshapes the economic landscape in which new treatments are evaluated. Yet cost-effectiveness thresholds tend to remain fixed over time. This report examines how inflation in NHS healthcare costs associated with resource use affects the estimation of incremental costs in health technology assessment (HTA), and what this means for the cost-effectiveness and commercial viability of new technologies when decision thresholds do not adjust accordingly.

Throughout this paper, we distinguish between intervention costs (e.g. the price of treatments) and background NHS costs (i.e. healthcare resource use associated with delivering care related or unrelated to an intervention). Annual publications of NHS unit cost data show that background costs have risen steadily across almost all categories of healthcare activity. Many new treatments extend life, generating additional years during which patients consume NHS services, increasing their exposure to inflating costs even when treatment prices remain fixed. This raises an important policy question: *what happens to the incremental cost, incremental cost-effectiveness ratio (ICER), and the value placed on a new technology when the costs of delivering care rise but thresholds remain static?*

We address this question through two complementary analyses. First, we conducted a top-down analysis of 11 published economic evaluations from *PharmacoEconomics-Open*, applying stylised inflation assumptions to explore how different cost structures and treatment characteristics mediate the relationship between inflation and incremental costs. Second, we developed a bottom-up oncology cost-effectiveness model using hypothetical interventions calibrated to three recent National Institute for Health and Care Excellence (NICE) technology appraisals (in breast cancer, non-small cell lung cancer, and lymphoma). The model applied historical NHS cost data (2000-2024) and projected inflation (2025-2030) to quantify the effect of rising background NHS costs on incremental costs and ICERs in different launch years, defined as the year in which an HTA is assumed to occur for the hypothetical intervention.

Inflation in background NHS costs causes incremental costs to rise over time for treatments that extend survival or incur higher NHS resource use than their comparators. In our bottom-up analyses, ICERs increased by between approximately 30% and 45% over the period 2000 to 2030, with the economically justifiable price (EJP) of each case study treatment declining by between 27% and 43%. Therefore, maintaining a consistent pricing signal would require thresholds to have increased by at least 30-45%.

All three base case treatments, anchored to be cost-effective at £25,000 per quality-adjusted life year (QALY) in the launch year 2000, exceeded a £30,000 threshold by a launch year of 2030, with the lymphoma case study crossing this threshold as early as 2019. Importantly, the direction of the effect reversed for treatments without an overall survival benefit, where ICERs declined marginally in later launch years, confirming that the mechanism is driven by the accrual of inflating costs during additional life years.

Based on our oncology case studies, the effects vary substantially across treatment types. Proportional EJP erosion was largest for treatments with longer post-progression survival. More efficacious treatments showed higher incremental costs and are therefore at greater risk of exceeding a static threshold. These findings underscore the importance of understanding how inflation interacts with incremental cost estimation in HTA, and suggest that the relationship between background NHS cost inflation and approval norms warrants explicit consideration in the design and review of cost-effectiveness thresholds.

1 Introduction

Prices for goods and services tend to rise over time, a phenomenon represented by inflation. For health technology assessment (HTA), this raises an important question: how does inflation in healthcare costs affect the estimation of incremental costs, and what are the implications for the valuation of new health technologies?

Academic literature offers differing perspectives on the role of inflation in HTA decision-making. Some argue that HTA should reflect the current opportunity cost of healthcare expenditure, often characterised as the cost of producing a quality-adjusted life year (QALY) in the health system (Claxton et al., 2015a; Culyer, 2015). The marginal cost per QALY (MCPQ) in the NHS is likely to change over time, but research to date has not succeeded in disentangling the influence of inflation from other effects (Claxton et al., 2015b; Low and Macaulay, 2022). Others have emphasised societal willingness to pay for health gains (Vallejo-Torres et al., 2016), which is typically benchmarked against values such as those in HM Treasury's Green Book (HM Treasury, 2026), and which has been acknowledged as subject to inflation (Padula, Chen and Phelps, 2021). There has been significant debate about what a cost-effectiveness threshold should represent, and what it might account for (Sampson et al., 2022; Kourouklis et al., 2022). However, this research has paid little attention to how inflation specifically affects incremental cost estimates in HTA, or the implications of this relationship for cost-effectiveness decision rules.

Throughout this paper, we distinguish between two categories of cost. We refer to intervention costs as the direct costs of a medicine or other technology being evaluated, which can be characterised as a price. We refer to NHS costs as the costs associated with other healthcare resource use, capturing the costs of services used in delivering and supporting care, including administration, monitoring, and disease management.

The National Institute for Health and Care Excellence (NICE) first revealed an explicit cost-effectiveness threshold in 2004 (Rawlins and Culyer, 2004). For the following twenty years, the standard threshold remained unchanged, with an adjustment announced in 2025 (NICE, 2025a). If the upper end of the UK's threshold were to have increased in line with inflation, it would now be estimated as £56,794 per QALY, suggesting a significant decline in its real terms value (Jordan, 2025). Over this same period, the technologies that NICE considers have changed substantially. Advances in precision medicine, gene therapies, and complex biologics have transformed the treatment landscape (McGonigle, 2025; Gupta, Sharma and Siddiqui, 2025), with an increasing share of NICE's appraisals concerning life-extending therapies, particularly in oncology.

Annual publications of NHS unit cost estimates demonstrate that healthcare costs increase over time. Both the National Cost Collection (NHS England, 2025b) (formerly NHS Reference Cost data (gov.uk, 2016)) and PSSRU Unit Costs of Health and Social Care publications (PSSRU, 2022) report unit costs by activity type and financial year, facilitating the estimation of inflation rates associated with specific categories of NHS expenditure. As NHS costs increase over time, incremental costs for new treatments may rise as a consequence of the cost of routine care and patient management growing with inflation. This effect may be particularly pronounced for life-extending therapies, where additional resource use during the extended survival period, exacerbate the effect of inflation on increasing incremental costs. If a cost-effectiveness threshold remains fixed while background costs rise, the cost-effectiveness when launching new treatments may be eroded over time, with potential consequences for pricing, commercial viability, and patient access.

The fundamental hypothesis underlying our analyses is that — when inflation is positive and uniform — incremental cost estimates for a new technology in HTA would grow in future launch years, proportional to the incremental cost associated with launch in the

current year. Although the ratio of costs would remain constant, the absolute difference in the cost of two technologies would increase. Consequently, the ICER associated with a new technology would increase in later launch years, and we would observe an inverse relationship between inflation and the economically justifiable price (EJP) of a technology.

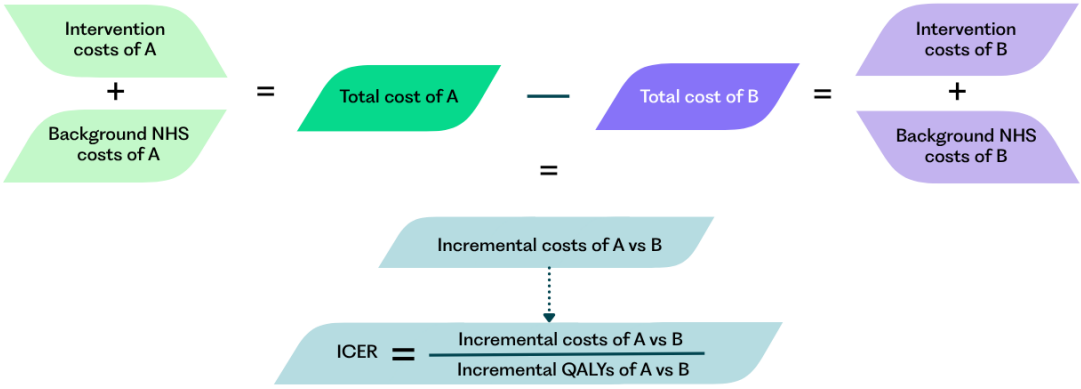
This paper explores the impact of inflation on incremental costs in HTA and considers the consequences for policy and market access. It also considers the effects on the EJP of treatments, which represents the maximum price at which a healthcare intervention would still be considered cost-effective under a given cost-effectiveness threshold (YHEC, 2025).

Section 2 presents top-down case studies drawn from published economic evaluations. Section 3 develops a bottom-up cost-effectiveness model using hypothetical interventions calibrated to recent NICE oncology appraisals. Section 4 discusses the findings and their implications.

Box 1 Relationship between inflation, incremental costs, and ICERs

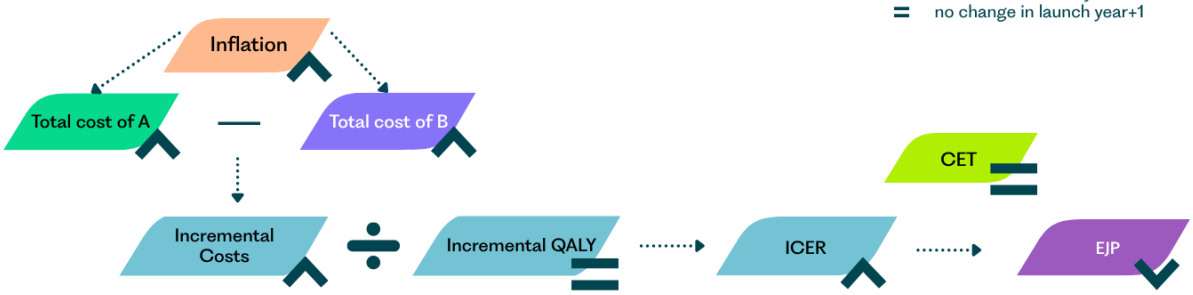
Launch year

ICER incremental cost-effectiveness ratio
QALY quality-adjusted life year
A new treatment
B comparator treatment



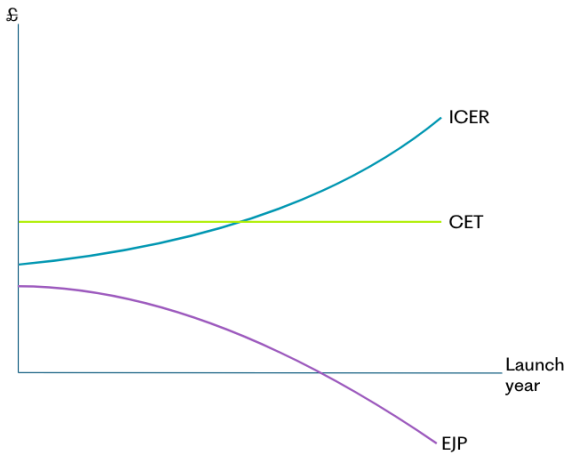
Effect of inflation

CET cost-effectiveness threshold
EJP economically justifiable price
^ increase in launch year+1
v decrease in launch year +1
= no change in launch year+1



Overview

- Health care costs are subject to inflation, increasing the absolute cost of all comparators.
- If inflation effects are equivalent across technologies, relative (incremental) costs will be higher in future.
- Where incremental QALYs remain constant, higher incremental costs imply a higher ICER for a later launch year.
- Cost-effectiveness thresholds (CETs) are not routinely increased with inflation, implying that a technology is less likely to be cost-effective at a later launch year.
- The economically justifiable price (EJP) of a technology is the price at which the ICER equals the threshold.
- In the context of a static CET and positive inflation, a cost-increasing technology will have a lower EJP at a later launch year.



2 Top-down case studies

Box 1 summarises the relationships that we seek to describe, and Appendix A sets out these relationships algebraically and in more detail. Having illustrated our hypothesised dynamics for the relationship between inflation and incremental costs in HTA, this section considers real world incremental cost estimates to illustrate the potential magnitude of these effects. We present top-down case studies using cost estimates derived from published literature. Through these case studies, we seek to identify the relationships between inflation and incremental costs for different types of technologies and different evaluation outcomes. We also examine how these effects change based on different inflation assumptions.

2.1 Methods

In order to avoid selection bias and to prioritise studies with complete reporting, we retrieved all studies from the collection of papers on Open-Source Models maintained by the journal PharmacoEconomics — Open. At the time of extraction, the collection included a total of 28 papers, covering a variety of countries and disease areas.

The inclusion criterion was that it must be possible to derive the necessary quantities for our analyses; the papers must include separate intervention costs ($C_{i,I}^{t}$) and background NHS costs ($C_{i,N}^{t}$) for both an intervention and a comparator.

After the selection process, a total of 11 papers were included in the analysis. Ten articles were rejected as intervention and background treatment costs were not distinguishable. Five articles were rejected because they were practical guidelines not containing cost parameters. One article was rejected due to lacking a clear comparator. One article was rejected due to its use of hypothetical costing data. The studies covered a variety of disease areas in various countries and are outlined in Appendix B: Top-down case study characteristics[1].

We extracted QALY estimates from those studies that reported them (Jankovic et al., 2022; Sepassi et al., 2023; Briggs et al., 2025; Meier et al., 2024; Dymond et al., 2025; Ong et al., 2024; Sligl et al., 2025; Bayani et al., 2024; Purohit et al., 2025). Two studies didn't contain QALY estimates (Mallick, Carlton and Van Stiphout, 2023; Mallick and Carlton, 2025). For the nine studies with suitable costing and QALY data, we estimated incremental cost-effectiveness ratio (ICER) trends and identified any change in implied decisions based on various potential thresholds.

The data from each study were extracted and incorporated into a spreadsheet model, applying the mechanisms described in Appendix A: Relationship mechanics to project incremental cost estimates and ICERs over time, using assumed inflation rates.

We considered three scenarios. In Scenario 1, we assumed 3% inflation for background NHS costs, and 0% inflation for all intervention costs. In Scenario 2, we assumed 3% inflation for all costs except for the comparator (technology B) intervention costs, for which we assumed 0% inflation. In Scenario 3, we assumed a uniform rate of 3% inflation for all costs.

[1] *Mallick and Carlton (2025) and Mallick, Carlton and Van Stiphout (2023), both use the same drug (Hizentra) for two different disease areas.*

Only Scenario 1 is presented here, as it constitutes the most representative set of circumstances for HTA in the UK, which typically considers new treatments for which prices are determined by HTA and commissioning processes, rather than wider economic circumstances. For new treatments, our analyses assume that the NHS is an effective price-maker, not a price-taker. Scenarios 2 and 3 may be more relevant for technologies and services that have costs to the NHS that are determined by external factors, such as the cost of labour (e.g. talking therapies) or infrastructure availability (e.g. screening programmes). Scenario 2 and Scenario 3 are presented in Appendix C.

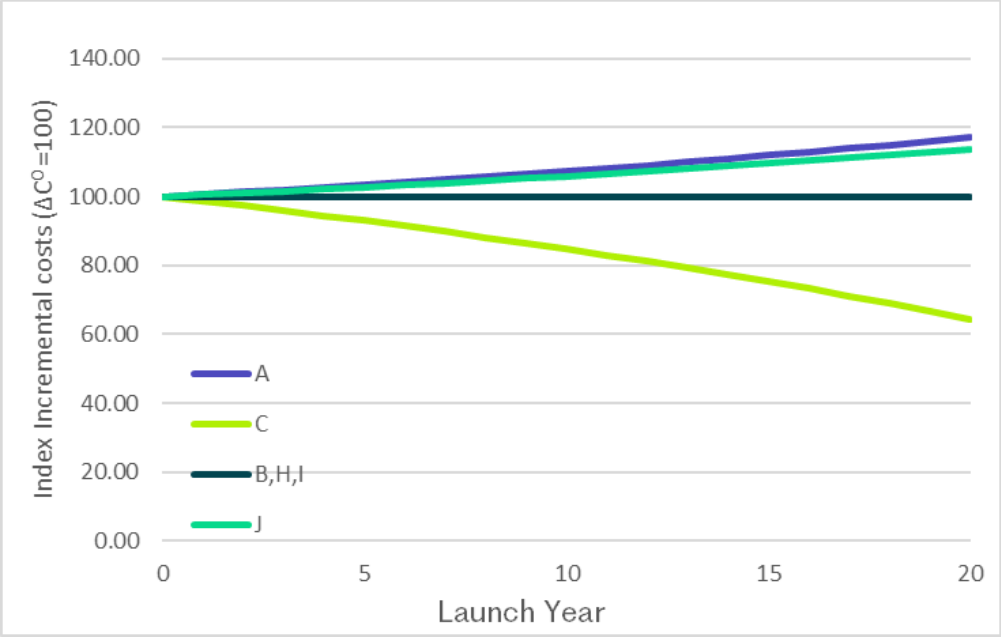
Of the 11 papers used in the analysis, 7 reported new interventions which were more costly in total than the comparator, with 4 reporting cost-saving interventions.

2.2 Results

In Scenario 1, the change in incremental cost due to inflation is a function of inflation and incremental background NHS costs between the new treatment and comparator. Therefore, a new treatment will be associated with an increase in incremental costs over time if NHS costs for the new treatment are greater than NHS costs for the comparator. A treatment will be associated with a decrease in incremental costs if its background NHS costs are lower than the comparator. If background NHS costs are equal between the treatment and its comparator, incremental costs will remain constant across launch years.

Figure 1 presents the indexed costs of all cost-increasing interventions being evaluated, for 20 years from the base year. Studies A and J show increases in incremental costs over time, due to greater NHS costs incurred by the new intervention. Study C shows a decline in incremental costs, as despite total costs being higher for the new intervention, intervention costs offset background NHS costs (for ongoing stroke care and treatment for complications), resulting in incremental costs diminishing with inflation under the assumptions of Scenario 1.

Figure 1 Top-down studies: indexed incremental costs



**Study F removed as new intervention flips to cost-saving and distorts graph.*

Three treatments showed no change in incremental costs due to inflation (B,H & I), because they assumed no difference in background NHS costs between the treatment and comparator. These treatments covered disease areas with relatively low background NHS costs and hence less scope for differentiation, or where a new treatment had no significant effect on background NHS costs: diabetic eye screening (Study I), insomnia (Study B), and dermatitis (Study H). In reality, we would reasonably expect some variation in background NHS costs between interventions and their comparators. Under the inflation assumptions in Scenario 1, interventions with smaller differences in background NHS costs will experience lesser effects of inflation on incremental costs.

A fuller account of the impacts of inflation on incremental costs, ICERs, and decision outcomes for each case study and scenario are described in Appendix C. A full list of citations, and characteristics of each case study are reported in Appendix B.

2.3 Implications

The top-down analysis provides an illustration of the association between intervention launch year and estimated incremental costs and cost-effectiveness.

Some interventions exhibit a decrease in incremental costs in later launch years, but these tend to be cost-saving interventions. Where cost-saving treatments are more effective, the new treatment is dominant, hence any decrease in incremental costs has no effect on decision-making. Where treatments are cost-saving and less-effective, keeping thresholds static in the presence of inflationary pressure may lead to a prioritisation of lower cost but less effective interventions. Where the total cost of a new technology is greater than that of its comparator, and associated with greater background NHS costs, incremental costs are higher in later launch years. The extent to which this may be counteracted by lower intervention costs (or vice versa) depends on our assumptions about the applicability of inflation to different categories of costs.

These top-down case studies provide an overview of different typologies of cost structure and the varying implications of inflation. Notably, many of the interventions evaluated in our top-down analysis are not likely to be representative of new treatments typically considered in HTA, which are often life-extending and cost-increasing. The next section of the report focuses on addressing the impact of inflation for HTA-relevant treatments in more detail.

3 Bottom-up case studies

To further explore the dynamics described above, and their implications for technologies typically considered by HTA agencies, we developed a series of bottom-up cost-effectiveness case studies based on actual NHS resource use and unit costs used in NICE technology appraisals. This approach isolates the effects of inflation on specific cost components of an economic evaluation while holding other model parameters constant, directly testing the mechanisms described above.

3.1 Methods

A model was developed in Microsoft Excel with Visual Basic macros to facilitate scenario analyses and output capture. A single model was used to explore all case studies.

Comparators

To select the bottom-up case studies we focused on the area of oncology. This therapy area dominates NICE HTA appraisals. Between 2016-17 and 2024-25, 61% of recommendations made by NICE (404 decisions of 664) were associated with oncology medicines (NICE, 2025f). These treatments are generally associated with relatively high background NHS costs. The three most frequent oncology indications in NICE appraisals are for breast, non-small cell lung cancer (NSCLC), and lymphoma (Jin and Szende, 2024). We selected these disease areas to form three separate base case analyses that may be generalisable to other oncology contexts. For each disease area, we identified the most recent NICE technology appraisal (TA)[2] as of 19th November 2025 to inform relevant model parameters:

- **Breast cancer**: TA1036 - Elacestrant for treating oestrogen receptor-positive HER2-negative advanced breast cancer with an ESR1 mutation after endocrine treatment (NICE, 2025d)
- **NSCLC**: TA1108 - Cemiplimab with platinum-based chemotherapy for untreated advanced non-small-cell lung cancer (NICE, 2025c)
- **Lymphoma**: TA1081 - Zanubrutinib for treating relapsed or refractory mantle cell lymphoma after 1 or more treatments (NICE, 2025e)

Disease-specific parameters for baseline patient characteristics, health state utilities, survival endpoints, and healthcare resource use patterns were extracted from appraisal documentation. Each indication launch was evaluated across cost years from 2000 to 2030 to assess the impact of inflation on incremental costs and cost-effectiveness.

[2] For breast cancer, TA1112 and TA1089 were terminated appraisals. TA1086 was an adjuvant treatment. TA1063 had resource use costs but frequency of each resource use is redacted. TA1040 was a cost comparison appraisal. For NSCLC and lymphoma, TA1108 and TA1081 were the most recent non-terminated appraisals respectively.

Model structure

A three-health-state partitioned survival model (PSM) was developed, consistent with the approach commonly used in NICE oncology TAs. In a PSM, health state occupancy at each time point is derived directly from the survival curves rather than from explicit transition probabilities.

All patients enter the model in the progression-free survival (PFS) state, receiving either the hypothetical intervention or comparator treatment. Patients may remain progression-free, experience disease progression, or die. Death is an absorbing state.

The analysis was conducted from the perspective of the NHS and personal social services (PSS), consistent with NICE's reference case. A lifetime horizon was applied, operationalised as 25 years, which was sufficient to capture >99% of deaths in all disease areas given the baseline ages and survival profiles. A weekly cycle length (7 days, no half-cycle correction) was employed to capture granular treatment and monitoring schedules typical of oncology care.

Both costs and health outcomes (QALYs) were discounted at 3.5% per annum, and life years were reported undiscounted, in accordance with NICE guidance.

Model parameters

Baseline characteristics

Patient baseline characteristics were extracted from the respective NICE technology appraisals for each disease area.

Progression-free survival and overall survival

Survival for the comparator arm was parameterised using exponential distributions, with scale parameters derived from median PFS and median OS reported in the respective NICE appraisals. The exponential rate (λ) was calculated from the median survival time (m) as:

$$\lambda = \frac{\ln(2)}{m}$$

Our use of exponential distributions assumes constant hazards over time, implying no long-term survivors or cure. This simplifying assumption was considered appropriate for this analysis as our focus is on the relationship between inflation and incremental costs rather than robust estimates of uncertainty in survival extrapolation.

Age- and sex-specific mortality rates were applied at each model cycle to ensure that disease-specific survival could not exceed general population survival. The model adjusted mortality rates for the sex distribution of each disease area cohort using a weighted average of male and female mortality rates. Background mortality was incorporated using UK national life tables (ONS, 2025).

Treatment efficacy

Treatment efficacy for the hypothetical intervention was modelled by applying hazard ratios (HRs) to the comparator survival functions. A base case HR of 0.5 was assumed for both PFS and OS, representing a clinically meaningful treatment effect consistent with the magnitude of benefits observed in recent oncology appraisals.

Treatment duration was assumed equal to time in the progression-free state (i.e. treatment until disease progression). No treatment waning effect was applied.

Table 1 presents baseline characteristics, survival and treatment efficacy parameters for each indication.

Table 1 Demographic and treatment efficacy parameters

	BREAST CANCER (TA1036)	NSCLC (TA1108)	LYMPHOMA (TA1081)
Age (years)	56.5	62	68
Proportion male	0.4%	46%	78%
Mean weight (kg)	65	65	65
Median PFS, comparator (months)	1.9	5.0	13.13
Median OS, comparator (months)	16.95	12.0	24.6
PFS exponential rate (per month)	0.3648	0.1386	0.0528
OS exponential rate (per month)	0.0409	0.0578	0.0282

Health state utilities

Health state utility values for the progression-free and progressed disease states were sourced from the respective NICE technology appraisals (Presented in Table 2). Where values were redacted in recent appraisals, utility estimates were drawn from earlier appraisals in the same disease area. Utilities were age-adjusted using Ara and Brazier (2010), which estimated the relationship between age and EQ-5D utility values in the UK general population. Adverse event disutilities were not included in the base case, as both intervention and comparator were assumed to be hypothetical treatments with equivalent tolerability profiles.

Table 2 Health state utilities

HEALTH STATE	BREAST CANCER	NSCLC	LYMPHOMA
Progression-free	0.701	0.765	0.78
Progressed disease	0.597	0.723	0.68
Source	TA992 (average from prior submissions)	TA1108	TA1081

Costs

The comparator was assumed to be an oral medication with a monthly acquisition cost of £500 and no administration cost in the base case. This represents a scenario where the standard of care is a relatively high-cost generic treatment. Generic comparators will become more common for oncology appraisals as many established therapies have reached or approach loss of exclusivity.

The intervention was also assumed to be an oral formulation in the base case. To isolate the effect of inflating background NHS costs on cost-effectiveness, the monthly acquisition cost of the intervention was set to achieve an ICER of approximately £25,000 per QALY threshold in the reference year (2000). The intervention price was held constant across subsequent cost years. Administration costs were applied per dose based on the route of administration and varied by cost year according to historical NHS Reference Cost data. Table 3 outlines administration costs, including those for our scenario analyses, described later.

Table 3 Administration costs

ROUTE	HRG CODE	DESCRIPTION	COST (2024)
ORAL	N/A	No administration cost	£0
INTRAVENOUS	SB12Z	Deliver simple parenteral chemotherapy at first attendance	£149.10
INTRAVENOUS (COMPLEX)	SB15Z	Deliver complex chemotherapy, including prolonged infusion treatment	£415.98

HRG — Healthcare Resource Group

Health state resource use was sourced from each of the respective TAs and with the relevant Healthcare Resource Group (HRG) code and resource descriptions and presented in Appendix E. Resource use frequencies were specified per model cycle for both the progression-free and progressed disease states. Resource use was applied independent of treatment within each health state. This implies that any differential in background NHS costs between arms arises solely from differences in health state occupancy (i.e. time spent in progression-free versus progressed disease states).

Unit costs for each resource category were extracted from the following sources for each year from 2000 to 2024:

- **The National Cost Collection**: NHS costs were sourced from the National Cost Collection for the NHS (formerly NHS reference costs for years prior to 2017). Published annually by NHS England (and previously the Department of Health), providing costs by HRG code. Data were extracted from Total HRGs where available, or for specific point-of-delivery categories as appropriate. (NHS England, 2025b; gov.uk, 2016; Department of Health, 2011)

- **PSSRU Unit Cost of Health and Social Care**: Published annually by the Personal Social Services Research Unit at the University of Kent, providing costs for primary care, community care, and social services. (PSSRU, 2022; COReC, 2025)

For years prior to 2002, where NHS Reference Cost data were limited or unavailable for specific HRG codes, unit costs were estimated by deflating 2010 values using the Hospital and Community Health Services (HCHS) Pay and Prices Index from the PSSRU publication.

Unit costs for years 2025 to 2030 were projected by inflating 2024 values using the average annual inflation rate observed over the preceding period. The inflation rate was derived from PSSRU Pay and Prices Index for adult services (all sectors) pay and prices including capital, which yielded an average annual inflation rate of 3.84% per annum, calculated as an average from the preceding 10-years. This rate was applied uniformly to all background NHS cost categories for the projection period. Intervention and comparator acquisition costs were held constant (i.e. 0% inflation for drug prices), reflecting the assumption that treatment prices are typically fixed at launch and may face downward pressure over time rather than inflation.

Subsequent treatment costs following disease progression were not included in the model. In cost-effectiveness analyses of oncology treatments, subsequent therapies are often identical across arms or their costs are highly uncertain. For the purpose of this analysis, exclusion of subsequent treatment costs provides a cleaner test of the hypothesised mechanisms, and the reference technology appraisals suggest that subsequent treatment costs are not likely to make a difference to our analyses.

End-of-life care was not included in the model. All patients in both treatment arms ultimately transition to the dead state within the time horizon, and the timing would have a negligible impact on the incremental costs estimated. Adverse event costs and disutilities were assumed to be zero in all analyses.

Scenario analyses

We use sensitivity and scenario analyses to explore whether the relationship between inflation and incremental costs is robust across alternative assumptions. NICE methods guidance suggests exploring structural uncertainty in models by using deterministic scenario analyses (NICE, 2025b), using more and less plausible scenarios, and we adopt this strategy here.

We adopt breast cancer as a representative case study for our treatment efficacy and IV administration scenarios, and only report results for this indication. We report low-cost generic and branded comparator scenarios for each indication.

All parameters included in our scenario analysis are reported in Table 4.

Table 4 Scenario analysis

SCENARIO	PARAMETER	BASE CASE	SCENARIO VALUE(S)
1. TREATMENT EFFICACY	Hazard ratios (OS and PFS)	0.5	a) 0.25 (Greater PFS & OS gains) b) 0.75 (Smaller PFS & OS gains) c) No OS gain (HR= 1) d) No OS gain and lower PFS gain (1 ,0.75) e) Less PPS gains (PPS HR 0.75) f) More PPS gains (PPS HR 0.25) g) Better SoC PFS (10-month median)
2. BRANDED COMPARATOR	Comparator acquisition cost	£500/month (generic)	a) Low cost comparator (£50/month) b) £1,500/month (branded)
3. IV ADMINISTRATION	Intervention administration	Oral (no administration cost)	Intravenous (NHS administration costs apply) a) IV SB12Z intervention b) IV SB 12Z Comparator c) IV treatment and Comparator

OS — overall survival, PFS — progression-free survival

Scenario 1: Treatment efficacy

The base case assumes a hazard ratio of 0.5 for overall survival and progression-free survival of the new intervention. This scenario tests hazard ratios of 0.25 (high efficacy) and 0.75 (low efficacy), with the same hazard ratio applied to both endpoints in each case.

Life-extending therapies generate additional years of survival during which patients incur inflating NHS costs. More effective treatments produce greater survival gains, increasing exposure to this effect. This scenario analysis tests whether the magnitude of survival benefit materially affects the relationship between inflation and cost-effectiveness.

Additionally, scenario 1c assumes no overall survival gains for a new treatment (HR-OS = 1); scenario 1d assumes no OS gains, and low efficacy for PFS; scenarios 1e and 1f test low (0.75) and high (0.25) PPS survival gains respectively. Scenario 1g increases comparator PFS from 1.9 to 10 months.

Scenario 2: Branded comparator

The base case assumes a comparator cost of £500 per month. This scenario explores the effect of having a low-cost generic comparator (£50 per month) and a higher-cost branded comparator with acquisition costs of £1,500 per month.

As targeted therapies and immunotherapies reach loss of exclusivity, many new technologies will be compared against lower-cost biosimilars or generics. This scenario tests how the baseline cost differential between intervention and comparator affects the relationship between inflation and cost-effectiveness. A smaller differential (with branded comparator) may moderate the effect: a larger differential may amplify it.

Scenario 3: Intravenous administration

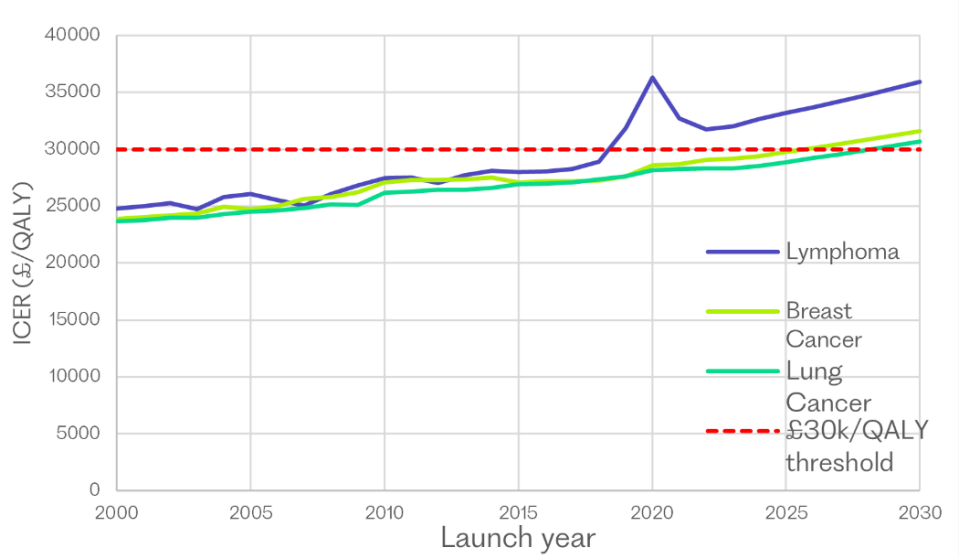
The base case assumes oral administration for both intervention and comparator. This scenario assumes that the intervention requires intravenous administration, incurring NHS administration costs that inflate over time.

Administration costs are subject to NHS inflation, unlike acquisition costs which are assumed fixed. Technologies with higher NHS resource requirements may be more sensitive to the relationships that we are estimating in this study.

3.2 Results

Figure 2 shows the ICER of each treatment for launch years from 2000 to 2030. Across all three oncology base case analyses, inflating NHS background costs was associated with a substantial increase in incremental costs and ICERs over the 2000 to 2030 period. In the lymphoma base case, the ICER rose from £24,794 in 2000 to £35,901 in 2030, an increase of 44.8% or approximately 1.2% per annum. Incremental costs grew correspondingly, from £36,673 to £53,103. The breast cancer base case showed an ICER increase from £23,900 to £31,599 (32.2%), while the lung cancer base case increased from £23,639 per QALY to £30,659 per QALY (29.7%).

Figure 2 ICER and launch year



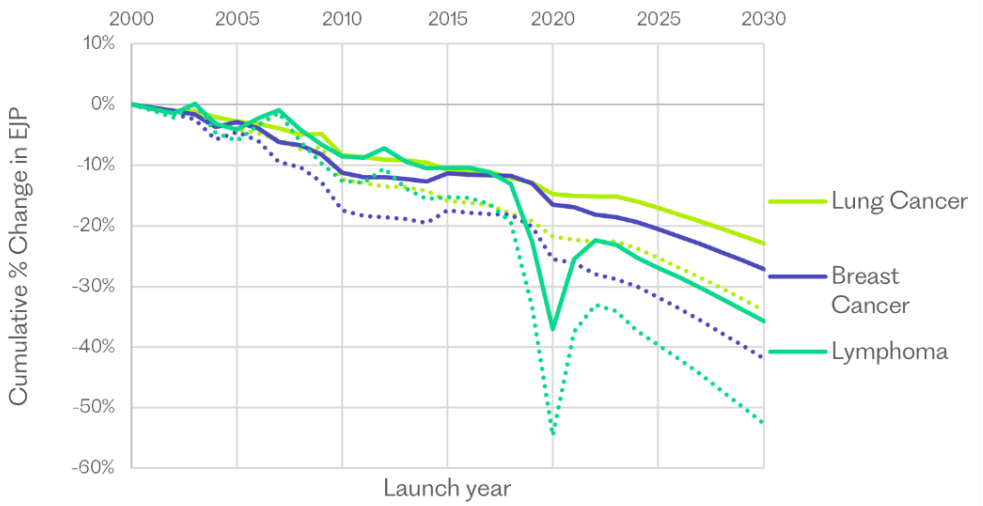
All three base case scenarios were anchored to achieve ICERs below £25,000 per QALY in the year 2000. By 2030, all three exceeded £30,000 per QALY, with the lymphoma case study crossing this threshold earliest, in 2019. Breast cancer crossed a £30,000 threshold in 2026 and lung cancer in 2029. The lymphoma case study displayed the largest absolute and proportional ICER increase, consistent with the longer post-progression survival and greater accumulated background NHS costs in this disease area.

The results show that whilst the effect of inflation is not constant nor consistent across the three treatments, inflationary pressure generally leads to a gradual increase in the ICER at launch. This is accentuated by the sharp increase in ICER for the lymphoma treatment during the COVID-19 pandemic, after which, launch ICER decreased and then continued to rise at around pre-pandemic rates.

These findings support the paper's central hypothesis: even when the intervention price and treatment efficacy are held constant, inflation in NHS background costs is eventually sufficient to erode the cost-effectiveness of life-extending treatments over time, since the longer life extension leads to a greater accumulation of these costs.

The effect of inflation on the economically justifiable price of each treatment is the inverse of its effect on incremental costs. Figure 3 shows the cumulative percentage change in the maximum economically justifiable price of each treatment between 2000 and 2030 launches, representing the maximum price industry can charge in order for the new treatment to still be considered cost-effective under a static cost-effectiveness threshold.

Figure 3 Economically justifiable price and launch year



**Solid line represents EJP at a £30k per QALY threshold, dashed line represents EJP at a £20k per QALY threshold.*

Each treatment experienced price erosion because of inflationary pressure, under a static threshold. This effect is greater if we assume a lower threshold, and hence a lower launch price of a treatment. From the year 2000, assuming a £20,000 per QALY threshold, the breast cancer treatment experienced an estimated 30.0% and 41.9% reduction by 2024 and 2030 respectively.

Full EJP trends, for each indication and different thresholds, are presented in Appendix D.

Scenario analyses

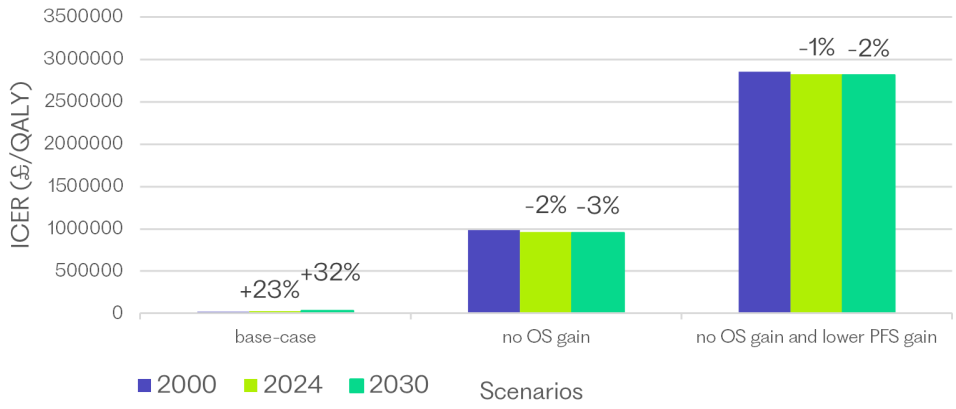
Appendix F summarises the incremental cost and ICER trajectories across the 15 scenarios that we explored. Several patterns emerge. First, the inflation effect is robust across scenarios. Every scenario involving a life-extending treatment exhibited ICER growth for later launch years over the 2000-2030 period. Second, the effect is substantial, with launch ICERs increasing between 15% and 48% over 30 years across the life-extending scenarios. This corresponds to a compound growth rate of around 0.5% to 1.3% per year. Third, the most important drivers of the magnitude of effect are the presence and extent of an overall survival benefit, the proportion of survival time spent in post-progression states, and the relative cost profiles of the intervention and comparator. We describe the results of each scenario analysis in more detail below.

Overall survival gain

The presence or absence of an overall survival (OS) benefit was the single most important determinant of the direction and magnitude of the inflation effect. Figure 4 shows the effect of inflation on ICERs for different overall survival scenarios. In the base case, the hypothetical intervention extended both PFS and OS (HR=0.5). When the OS benefit was removed, such that the treatment provided only a PFS gain, the direction of the inflation effect reversed: the ICER declined marginally from £982,308 in 2000 to £953,881 in 2030 (-2.9%). A similar pattern was observed when both OS and PFS gains were reduced (scenario 1d), with ICERs declining by approximately 1.6%. Note that Figure 4 shows absolute ICERs for consistency, which masks the greater magnitude of change in the base

case. Although the scenario analysis ICERs are above plausible cost-effectiveness thresholds, the reversal in direction is instructive. It demonstrates that the mechanism driving ICER growth in the base cases is the accrual of inflating background NHS costs during additional life-years gained by the intervention. When no additional survival is achieved, the intervention does not generate additional years of inflating healthcare expenditure, and the modest decline in incremental costs over time reflects the fact that higher background costs accrue symmetrically across both arms.

Figure 4 No overall survival gain - breast cancer



Treatment efficacy

Varying the treatment efficacy affected both the level and growth rate of ICERs. When the hazard ratios were reduced, representing a more efficacious intervention with greater survival gains, the ICER was substantially higher in absolute terms at baseline, but its proportional increase over time was smaller (18.4% from 2000 to 2030). When hazard ratios were increased, representing a less effective treatment with more modest survival gains, the ICER started lower but grew by 38.9% to £27,365 per QALY by 2030.

This pattern is explained by the interaction between the magnitude of survival gain and the structure of costs. Treatments with larger survival benefits generate more incremental QALYs in the denominator, which partially absorbs the impact of rising incremental costs. However, such treatments also generate more years over which inflating background costs accumulate. The net effect is that more efficacious treatments have higher absolute ICERs but are somewhat more resilient to proportional erosion from inflation, because the QALY denominator is larger relative to the incremental cost numerator.

Post-progression survival

The distribution of survival time between the progression-free and post-progression states was a strong modifier in the inflation effect. When the proportion of time spent in post-progression survival was increased, the ICER grew by 47.8% for launch in 2030 compared to 2000, which was the largest proportional increase in any scenario. When post-progression survival was reduced, the ICER grew by only 14.8%.

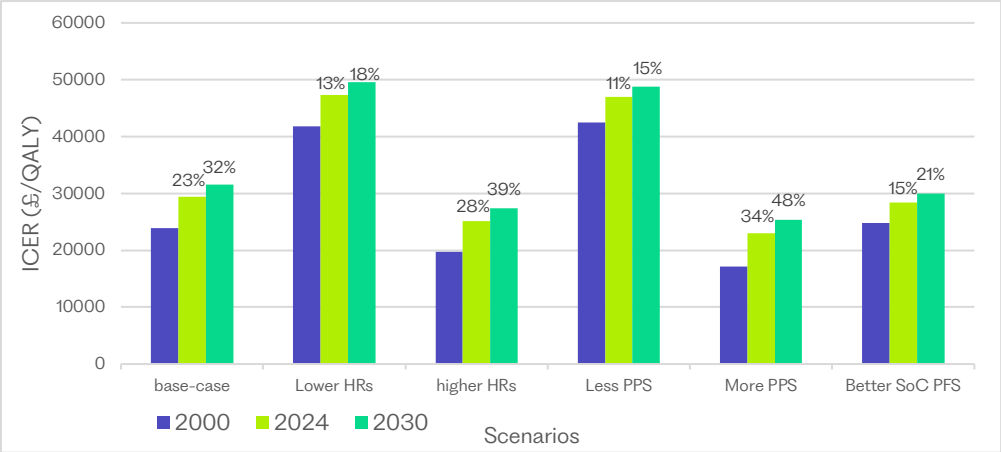
This finding is consistent with the expectation that post-progression health states typically incur higher unit costs per cycle than progression-free states, reflecting more intensive monitoring, supportive care, and disease management. Since these costs inflate over time, treatments that extend post-progression survival accrue more inflating costs per additional life-year.

Comparator PFS

Improving the comparator PFS reduced the proportional ICER growth to 20.8%. A comparator with longer PFS reduces the incremental survival gain and therefore the additional period over which inflating background costs are accrued by the intervention. This further reinforces the finding that the magnitude of the survival differential between treatment arms is a key driver of the inflation effect.

The effect of inflation on the ICER of our breast cancer treatment for each treatment efficacy, post-progression survival and comparator PFS scenarios are presented in Figure 5.

Figure 5 Treatment efficacy and survival – breast cancer



HR = hazard ratio, PPS = post-progression survival. PFS = progression-free survival

Comparator cost

Figure 6, Figure 7 and Figure 8 present the effect of different comparator costs on the relationship between inflation and ICER for each of our case studies. Reducing the comparator cost increased the ICER at baseline, and caused the £30,000 threshold to be crossed five years earlier than the base case. Increasing the comparator cost lowered the ICER at baseline, giving a lower trajectory, such that the £30,000 threshold was not exceeded within the modelled time period. Even so, the proportional growth in the ICER over time was larger in this scenario than in the base case (36.8% vs 32.2%). This is because the absolute growth in background NHS costs is similar across scenarios, but a higher comparator cost reduces the incremental cost at baseline; the same absolute growth represents a larger proportional change. This effect was greater in both lymphoma and lung cancer treatments (86% vs 45% and 45% vs 30% respectively).

Figure 6 Cost of comparator – breast cancer

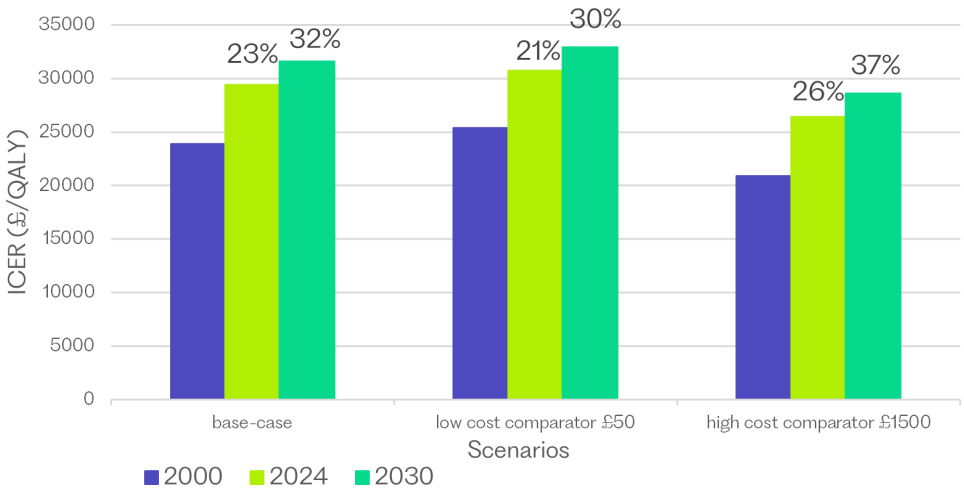


Figure 7 Cost of comparator – lymphoma

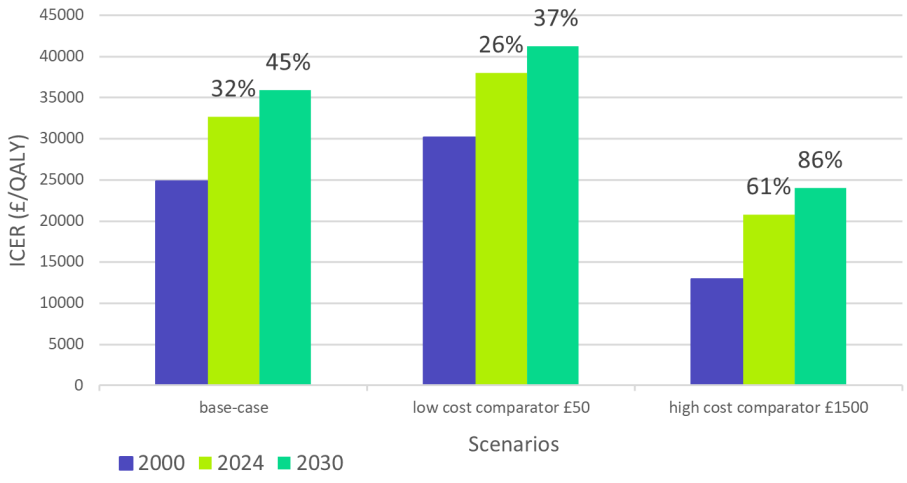
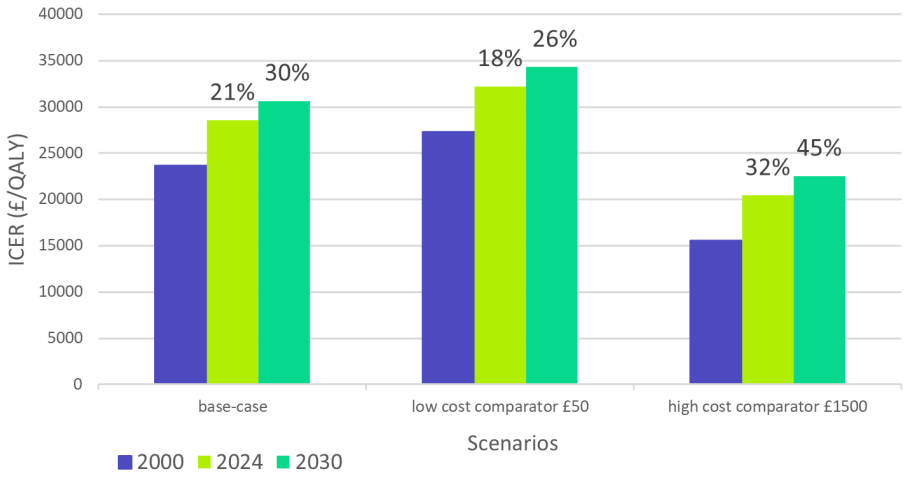


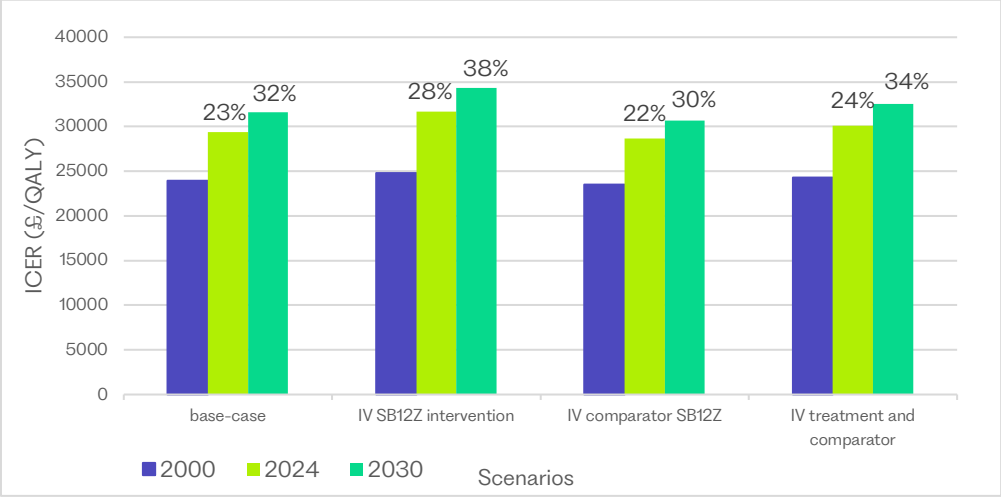
Figure 8 Cost of comparator – lung cancer



Mode of administration

Switching the mode of administration from oral to IV accelerated the growth of the ICER at later launch years, which increased by 38.4% compared with the base case of 32.2% (Figure 9). This is because IV administration adds a substantial inflating background cost component to the intervention arm. By contrast, applying IV administration to the comparator partially offsets this effect, as the comparator also incurred the inflating administration costs.

Figure 9 IV administration – breast cancer



4 Discussion

4.1 Summary of findings

This paper examined the impact of inflation in NHS healthcare resource use costs on incremental costs in HTA, and the consequences for cost-effectiveness and commercial viability when decision thresholds remain static. Through both top-down and bottom-up analyses, we explored the idea that rising background NHS costs increase incremental costs over time, even when treatment prices are held constant.

Our top-down analysis of 11 published economic evaluations demonstrated that the direction and magnitude of the inflation effect depends on the cost structure of the technologies being compared. Under the most policy-relevant scenario, in which intervention costs are fixed and background NHS costs inflate, treatments with higher background NHS costs than their comparators experienced rising incremental costs, while those with lower background NHS costs saw incremental costs decline. In the case of life-extending treatments, additional years of survival is likely to lead to an increase in other NHS costs related to treatment, therefore causing the effects of inflation to disproportionately affect treatments with survival benefits.

Our bottom-up oncology cost-effectiveness model provided a direct test of the central hypothesis using historical NHS resource use and cost data. Across all three base cases — breast cancer, NSCLC, and lymphoma — ICERs increased substantially for later launch years between 2000 and 2030, rising by between approximately 30% and 45%. All three treatments, anchored to be cost-effective at £25,000 per QALY for a launch in the year 2000, exceeded the £30,000 per QALY threshold for a launch in 2030. The economically justifiable prices of the case study treatments declined by between 27% and 43% over the same period. Importantly, when overall survival gains were removed, the direction of the effect reversed: ICERs decline marginally over time.

One argument against increasing thresholds with inflation is that increases in productivity in the NHS may counteract the impact of inflation. As described in Appendix A, increases in NHS productivity should — at least partially — be reflected in unit costs, and to this extent, our bottom-up case studies account for improvements in productivity. Without productivity improvements, we would anticipate unit costs to rise faster, and for incremental costs to increase at a faster rate than shown in our analyses.

In our scenario analyses, every scenario involving a life-extending treatment exhibited ICER growth over the study period, with increases ranging from 15% to 48%. The most important determinants of the magnitude of the effect were the presence and extent of an overall survival benefit, the proportion of survival time spent in post-progression states, and the mode of administration.

This has implications for innovation incentives. The economically justifiable price of every life-extending treatment in our scenario analyses declined over the modelled period, regardless of efficacy. The largest proportional EJP erosion occurred for treatments with longer post-progression survival and those requiring intravenous administration. More efficacious treatments showed smaller proportional EJP erosion, because additional QALYs partly absorb rising incremental costs, but their higher absolute ICERs at launch leave them most exposed to a static threshold.

4.2 Strengths and limitations

This study addresses a gap in the literature by focusing specifically on how inflation affects the incremental cost component of cost-effectiveness analyses. The use of two complementary analytical approaches, supported by clear explication of the relationship mechanics, strengthens the findings. The top-down case studies, drawn from an independently curated collection of open-source models, reduced the risk of selection bias and provided a range of evaluation typologies beyond the technologies typically considered in HTA, allowing us to explore varying relationships. The bottom-up model allowed us to apply actual historical NHS cost data, providing empirical grounding for the estimated effects.

Several limitations should be acknowledged. Our bottom-up analyses used simplified model structures with exponential survival distributions, which assume constant hazards and do not accommodate long-term survivors or cure. This simplification was appropriate for isolating the inflation mechanism, but means our case studies are approximations rather than reconstructions of the referenced NICE technology appraisals. Similarly, the use of a constant hazard ratio to model treatment efficacy assumes proportional hazards, which was not formally assessed. Given that the focus of the analysis is on the relationship between inflation and incremental costs, we have no reason to believe that these simplifications should materially affect the interpretation of our findings.

Our bottom-up analysis models our three case studies based on a starting ICER of approximately £25,000. Whilst we present results in real terms and discuss implications on decisions rules at £30,000 and £35,000 thresholds as stylised examples, the model doesn't accurately represent changes in decision rule for each case study, rather indicative consequences based on our modelling assumptions. Different indications may be assessed based on different thresholds, and changes in actual decision rules will depend on the appropriate threshold and cost-effectiveness at launch in year 0.

Future inflation rates were projected using historical averages derived from the PSSRU Pay and Prices Index, and a single rate was applied uniformly across all background NHS cost categories for the projection period. In practice, inflation rates vary across categories of NHS expenditure, and actual future inflation may deviate from historical trends. Our use of a uniform inflation rate for projections may understate the effect for cost categories that have historically inflated faster than average, and overstate it for others.

Subsequent treatment costs were excluded from the model. In oncology cost-effectiveness analyses, subsequent therapies are often identical across arms, and the reference technology appraisals suggest that their inclusion would not materially alter our findings. End-of-life costs were similarly excluded, as all patients in both arms transition to death within the model time horizon, making the impact on incremental costs negligible. The model also did not account for waning effects and, whilst these effects may have a slight impact on the magnitude of inflation, these effects are likely negligible and will have no implication on the direction of effect.

It is also important to note that there is significant variation across the health service, in terms of the costs that providers face and the efficiency with which they deliver health services (Hernandez-Villafuerte et al., 2022; Martin et al., 2023). Our estimates should be considered in the context of a single threshold being applied, and a single price being paid, for any given technology. It is beyond the scope of this study to consider how the impact of inflation on decision-making may be influenced by heterogeneity across health services.

4.3 Implications for research

Our findings highlight a dimension of cost-effectiveness analysis that has received insufficient attention in the methodological literature. The relationship between inflation and incremental costs is not simply a matter of applying a price index to historical estimates; it interacts with treatment characteristics, cost structures, and survival profiles in ways that have material consequences for ICERs and decision-making. This suggests that future methodological research should consider how inflation in background costs should be reflected in economic evaluations, particularly for life-extending therapies.

The recent announcement that NICE will increase its standard cost-effectiveness threshold to a range of £25,000 to £35,000 per QALY provides an important context. This change is intended to "maximise the government's commitment to unlock innovation" (NICE, 2025a). Our analysis highlights methodological considerations that should inform the design and period review of any threshold, whether static or dynamic. Our findings suggest that the relationship between background cost inflation and the threshold warrants explicit investigation, and that any future revision of the threshold should consider the rate at which inflating background costs erode cost-effectiveness over time.

Costs associated with developing treatments, such as the costs of clinical trials, have also increased over the period studied, though these were not considered in our model. The interaction between inflation in development costs and inflation in background NHS costs may warrant further research, particularly for understanding the long-term sustainability of pharmaceutical innovation.

4.4 Implications for industry

Our analysis reveals a decline in the economically justifiable price of the case study treatments over the study period. This effect is compounded by the erosion of purchasing power, which means that the cost-effective price of a treatment in 2025 is not only lower in nominal terms than it would have been in 2000, but significantly lower in real terms. This indicates a substantial decline in the value placed on the same health improvements.

The findings have direct implications for the commercial viability of new treatments in the UK. A treatment that is cost-effective at a £25,000 per QALY threshold using year 2000 NHS costs would, in most scenarios modelled, exceed a £30,000 per QALY threshold if considered around 20 to 30 years later, solely as a consequence of rising background NHS costs. Treatments such as our lymphoma case study, which were cost-effective at a £25,000 per QALY threshold in 2000, would not be cost-effective if launched at the same price in 2030, even under a new upper-limit threshold of £35,000 per QALY.

The effect is amplified for certain treatment types. Treatments administered intravenously, combination therapies with additional administration costs, and those with longer post-progression survival are likely to be most affected. As targeted therapies and immunotherapies reach loss of exclusivity, new technologies will increasingly be compared against lower-cost biosimilars or generics (NHS England, 2025a). This alone, will substantially reduce the EJP of the new technology. Additionally, widening the cost differential between intervention and comparator could potentially amplify the inflation effect even further.

The transition from the end-of-life modifier to the severity modifier has also reduced the effective upper threshold for life-extending treatments, from £50,000 per QALY to approximately £36,000 per QALY for treatments currently meeting the 1.2x severity threshold, assuming an acceptable ICER threshold of £30,000 per QALY (Batteson et al.,

2023). These pressures compound the inflationary dynamics described in this paper and are likely to become more pronounced as established therapies reach loss of exclusivity.

4.5 Implications for policy

Our findings demonstrate that a static cost-effectiveness threshold systematically disadvantages the types of innovation that deliver the greatest survival gains. Treatments with higher efficacy are more exposed to the effects of inflation, and those with large life-extending benefits are disproportionately affected due to increased resource use, resulting from extended survival. Under a fixed threshold, the implicit prioritisation shifts over time away from life-extending treatments and toward cost-saving or non-life-extending interventions. This trend is at odds with policy objectives such as the National Cancer Plan's target of 75% five-year survival (NHS England, 2026).

The recent announcement of an increase in the threshold range to £25,000 to £35,000 per QALY represents an acknowledgement that a fixed threshold is not sustainable. However, our case studies show that this adjustment does not reflect the likely impact of inflation on incremental costs. Given an average annual ICER increase of approximately 1% due to background cost inflation across our three base case treatments, the recently announced 16.7% increase in the upper threshold is equivalent to around 17 years of inflationary pressure on a launch ICER, despite being the first adjustment in more than 20 years. Our lymphoma case study would exceed even the new £35,000 upper-bound by 2030. The inflation effect will continue to erode the cost-effectiveness of new treatments unless the threshold is subject to regular review and periodic adjustment.

The trends revealed by this study raise questions about the sustainability of the current framework for valuing treatments. The UK spends approximately 9% of healthcare spending on pharmaceuticals, compared with 13-14% in Germany and up to 20% in Japan (Assender, 2025). An environment in which the cost-effectiveness of life-extending treatments is progressively eroded by inflation, without compensating adjustments to the threshold, is incompatible with the UK government's ambitions for the life sciences sector.

4.6 Conclusions and recommendations.

This paper provides evidence that when the impact of inflation on NHS background costs is isolated, incremental costs rise over time for life-extending treatments. This effect is sufficient to erode the cost-effectiveness of new treatments under a static threshold, with ICERs increasing by around 30-45% across our oncology case studies over a 30-year period. The mechanism is robust across a range of assumptions including treatment efficacy, comparator costs, and mode of administration. The effect is largest for treatments that extend overall survival, that involve longer post-progression survival, and that are administered intravenously.

These findings call into question the suitability of a static cost-effectiveness threshold in the presence of sustained inflation in healthcare costs. Our analysis suggests that the recently announced 17-25% increase in NICE's threshold (to £25,000-£35,000 per QALY) may be less than the anticipated erosion in EJPs due to inflation over the period studied. In all base case analyses, ICERs increased by more than 20% between a launch year of 2000 and a launch year of 2026.

We recommend that the relationship between background NHS cost inflation and cost-effectiveness thresholds be given explicit consideration in the design and review of HTA decision rules.

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Appendices

Appendix A: Relationship mechanics

To illustrate the relationship between inflation and incremental cost estimates in economic evaluation, we consider a stylised example comparing two healthcare technologies: a new treatment (technology A) and the current standard of care (technology B). Each technology generates two categories of costs: intervention costs (direct cost or price of the treatment itself) and background NHS costs (associated healthcare resource use including administration, monitoring, managing adverse events, and other care).

Let $C_{i,j}^t$ denote the cost of technology $i \in \{A, B\}$ in cost category $j \in \{I, N\}$ at time period t, where I represents intervention costs and N represents background NHS costs. The baseline or reference year costs (at $t = 0$) are denoted without the time superscript: $C_{i,j} = C_{i,j}^0$.

Let $\pi_{i,j}$represent the annual inflation rate for cost category j under technology i. The total cost of technology i at time t is:

$$C_i^t = C_{i,I}^t + C_{i,N}^t$$

The incremental cost of technology A relative to technology B at time t is:

$$\Delta C^t = C_A^t - C_B^t$$

Incremental costs, unit costs, and productivity

Background NHS costs ($C_{i,N}^t$) are defined as the sum of quantities of resource use multiplied by their unit costs:

$$C_{i,N}^t = \sum_k q_{i,k} u_k^t$$

where k indexes distinct resource use types (e.g. inpatient days, outpatient procedures) and $q_{i,k}$ is the quantity of resource k consumed alongside technology i and u_k^t is the unit cost of resource k at time t.

As we are considering the impacts of inflation on costs, it is important to consider how the average cost of delivering a given service or intervention is realised. In practice, the average cost of delivering care (and therefore its unit cost) is a function of the prices of inputs necessary to deliver resource k (e.g. wages, consumables, capital), and the NHS's productivity in delivering resource k, such that:

$$u_k^t = \frac{p_k^t}{\theta_k^t}$$

where p_k^t represents input prices and θ_k^t represents an estimate of productivity. If input prices grow at rate $\pi_{p,k}$ and productivity grows at rate g_k, then:

$$u_k^t = \frac{(1+\pi_{p,k})^t}{(1+g_k)^t}$$

We can simplify this by defining an effective unit cost inflation rate of π_k, such that:

$$u_k^t = u_k(1+\pi_k)^t$$

This provides a full expression of background NHS costs as:

$$C_{i,N}^t = \sum_k q_{i,k} u_k (1+\pi_k)^t$$

Incremental background NHS costs at time t therefore become:

$$\Delta C_N^t = \sum_k (q_{A,k} - q_{B,k})\, u_k (1+\pi_k)^t$$

Or:

$$\Delta C_N^t = \sum_k \Delta q_k u_k^t$$

This demonstrates an important point: even if technologies A and B are subject to identical unit costs, the incremental cost depends on the distribution of resource use differences across categories with different inflation rates. A technology that shifts resource use toward high-inflation categories will see its incremental costs grow faster over time. Importantly for the context of our analysis, these expressions imply that productivity growth in the NHS is reflected in unit costs and, specifically, in lower unit cost inflation than might otherwise be expected.

Incremental costs in time

In the baseline period ($t = 0$), the incremental cost is simply the difference in total costs:

$$\Delta C^0 = (C_{A,I} - C_{B,I}) + (C_{A,N} - C_{B,N})$$

or

$$\Delta C^0 = \Delta C_I^0 + \Delta C_N^0$$

In a multi-period model, when all costs inflate at a common rate π, costs in period t are estimated as:

$$C_{i,j}^t = C_{i,j}(1+\pi)^t$$

Such that the incremental cost at time t is:

$$\Delta C^t = \Delta C^0 (1+\pi)^t$$

This implies our first impact of inflation on incremental costs, and constitutes the principal hypothesis underlying our paper: when inflation is positive and uniform,

incremental costs grow proportionally to the baseline incremental cost. That is, although the ratio of costs remains constant, the absolute difference in the cost of technologies A and B increases over time.

Incremental costs with differential inflation

When inflation rates differ across cost categories, the model becomes:

$$C_{i,j}^{t} = C_{i,j}(1 + \pi_{i,j})^{t}$$

The total cost for technology i at time t becomes:

$$C_{i}^{t} = C_{i,I}(1 + \pi_{i,I})^{t} + C_{i,N}(1 + \pi_{i,N})^{t}$$

and the incremental cost becomes:

$$\Delta C^{t} = C_{A,I}(1 + \pi_{A,I})^{t} - C_{B,I}\left(1 + \pi_{B,I}\right)^{t} + C_{A,N}(1 + \pi_{A,N})^{t} - C_{B,N}(1 + \pi_{B,N})^{t}$$

By examining the first difference of incremental costs, we can consider the necessary conditions for incremental costs to remain constant, such that $\Delta C^{t+1} = \Delta C^{t}$ for all t. This condition can only hold if all inflation rates are zero. Even with uniform inflation across all categories, the absolute incremental cost increases over time, as described above.

However, differential inflation rates introduce the potential for incremental costs to decline over time. For this to be the case when technology A is initially more expensive ($\Delta C^{0} > 0$), we require:

$$\frac{d(\Delta C^{t})}{dt} < 0$$

For incremental costs to decline when A is initially more expensive, technology B must exhibit higher absolute cost growth despite having lower total costs. This can occur in one of two scenarios:

- Technology B is subject to substantially higher inflation rates than A, or
- Technology B has a large baseline cost component with high inflation while A's high-inflation components are small.

A more likely scenario is that intervention costs (e.g. for branded medicines) may, at least in the short term, be fixed, while background NHS costs are rising. In this case, the incremental cost trajectory depends on the sign of $(C_{A,N} - C_{B,N})$:

- If $C_{A,N} > C_{B,N}$, incremental costs increase over time
- If $C_{A,N} < C_{B,N}$, incremental costs decrease over time
- If $C_{A,N} = C_{B,N}$, incremental costs remain constant

With differential inflation rates, the baseline distribution of costs between intervention and NHS cost categories fundamentally shapes how inflation affects incremental costs. Technologies with higher cost shares in high-inflation categories will see their total costs grow faster. When the new treatment (A) has a higher proportion of fixed-price intervention costs while standard care (B) relies more

heavily on inflating NHS costs, incremental costs may decline even when A is initially more expensive.

Economically justifiable price

The EJP of a treatment is defined by the maximum price at which an intervention would still be considered cost-effective. Hence given a static threshold T, and a marginal utility of a treatment ΔU, the EJP of a treatment is such that:

$$T = \frac{\Delta c^t_{max}}{\Delta U}$$

Hence the marginal cost of a treatment at the E JP price at launch can be written as:

$$\Delta C_{max} = \Delta UT$$

We consider the effect of inflation on EJP under a static threshold, and no change in marginal utility over time, such that ΔUT is static, independent of t.
The marginal cost of a treatment at launch EJP price at t launch years can be written as:

$$\Delta C^t = \Delta C_{\max}(1+\pi)^t$$

Where π, represents the annual effect of inflation.

The max EJP price at time t is set such that:

$$\Delta C^t_{max}(1+\pi)^t = \Delta UT.$$

Hence,

$$\Delta C^t_{max} = \frac{\Delta UT}{(1+\pi)^t}$$

Equivalently:

$$\Delta C^t_{max} = \frac{\Delta C_{max}}{(1+\pi)^t}$$

Hence there is an inverse relationship between inflation and EJP. Assuming static threshold and increasing treatment costs as a result of inflation, we can expect to see a decline in the EJP of a treatment over time.

Appendix B: Top-down case study characteristics

Table A1 Characteristics of studies used in top-down model

CASE STUDY	CITATION	DISEASE AREA AND SETTING	CE PLANE QUADRANT AND CHARACTERISTICS	NOTES
A	(Bayani et al., 2024)	First-line daratumumab use for newly diagnosed, transplant-ineligible multiple myeloma in Singapore.	Intervention more costly and more effective. Higher treatment and other NHS costs.	High cost intervention, around $5000 per dose.
B	(Briggs et al., 2025) *	Daridorexant for treatment of chronic insomnia disorder in adults in England, Scotland, and Wales.	Intervention more costly and more effective. Other NHS costs equal.	All additional costs classified as intervention costs.
C	(Dymond et al., 2025)	Insertable cardiac arrhythmia monitor after non-ST-elevation myocardial infarction in the UK.	Intervention more costly and more effective. Higher treatment costs but lower other NHS costs.	
D	(Jankovic et al., 2022)	Digital interventions for generalised anxiety disorder in the UK.	Intervention less costly and more effective. Higher treatment costs but lower other NHS costs.	Multiple comparators. Group therapy selected as dominant comparator.
E	(Mallick, Carlton and Van Stiphout, 2023)	Hizentra for maintenance treatment of chronic inflammatory demyelinating polyneuropathy in the US.	Intervention less costly. Lower treatment and other NHS costs.	No QALY data (budget impact model)
F	(Mallick and Carlton, 2025)	Hizentra for primary immune deficiency in the US.	Intervention more costly. Higher treatment costs but lower other NHS costs.	No QALY data (budget impact model)
G	(Meier et al., 2024)	Etranacogene dezaparvovec for haemophilia B in Germany.	Intervention less costly and more effective. Lower treatment and other NHS costs.	
H	(Ong et al., 2024) *	Upadacitinib for moderate to severe atopic dermatitis in Singapore.	Intervention more costly and more effective. Other NHS costs equal.	Comparator is best-supportive care and assumes no intervention costs.
I	(Purohit et al., 2025) *	Optimising diabetic retinopathy screening in India.	Intervention more-costly and more-effective. Other NHS costs equal.	
J	(Sepassi et al., 2023)	Letermovir for cytomegalovirus prophylaxis in the US.	Intervention more costly and more effective. Higher treatment and other NHS costs.	

K	(Sligl et al., 2025)	Antimicrobial stewardship procalcitonin testing and rapid blood culture identification in sepsis care in Canada.	Intervention less costly and less effective. Lower treatment and other NHS costs.

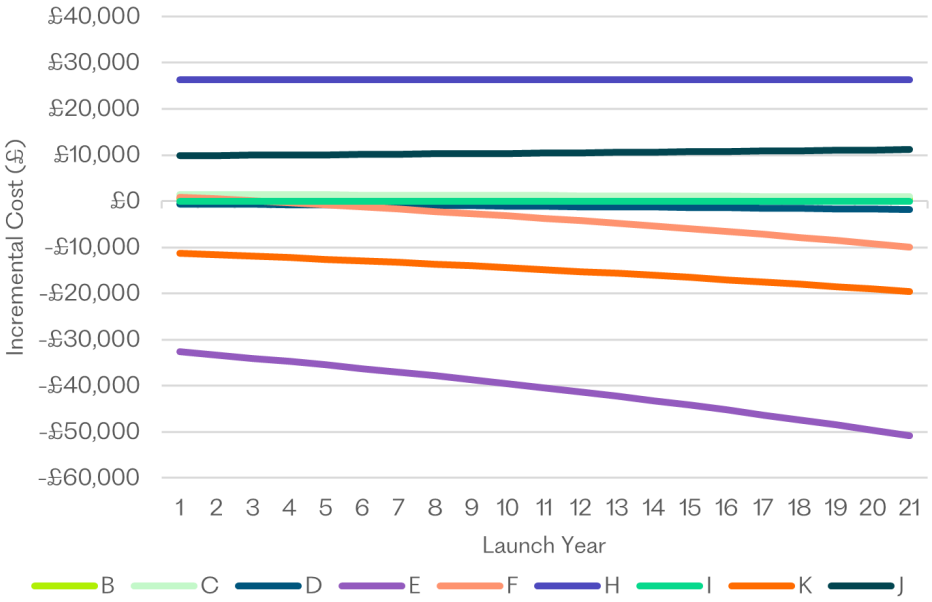
** Include no distinction between other NHS costs of new treatment and comparator.*

Appendix C: Top-down analysis results

In scenario 1, we consider the effects of inflation on incremental costs when holding all intervention costs constant ($\pi_I = 0$), and applying 3% inflation to other NHS costs ($\pi_N = 0.03$).

In this scenario, 2 out of the 11 treatments experienced an increase in incremental costs, 6 exhibited a decrease of incremental costs over the 20-year time horizon, and 3 experienced no change in incremental costs. Out of the 6 showing decreased incremental costs, 4 were cost-saving and 2 were more costly treatments with high comparator background NHS costs. Whilst both treatments showing an increase in incremental costs with inflation had more expensive treatment and NHS background costs.

Figure A1 Incremental costs over time – Scenario 1



**Studies A and G were removed due to high incremental costs.*

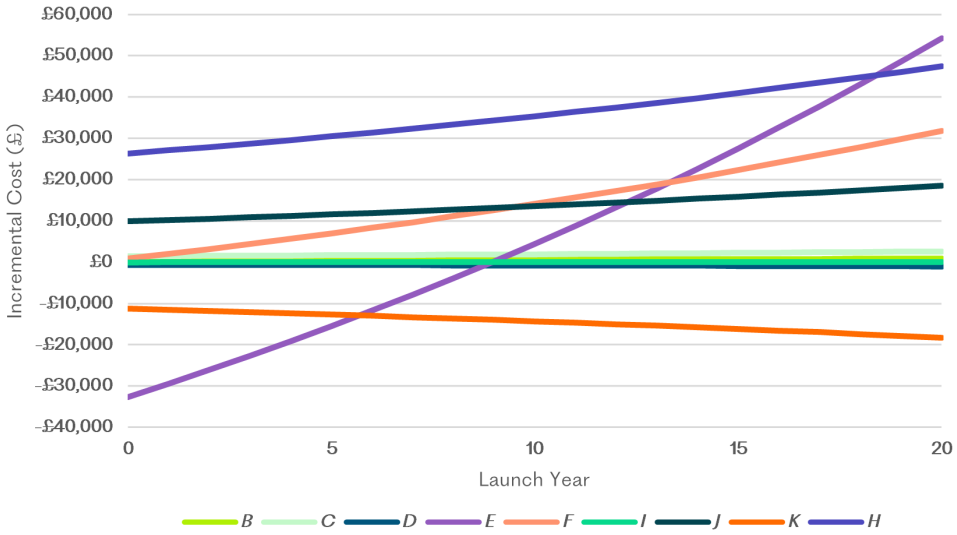
In scenario 2, we consider the effects of inflation on incremental costs when holding only intervention costs of comparators constant ($\pi_{B,I} = 0$). The change in the incremental cost of the treatment is now a function of total new treatment costs (C_A^0), other NHS costs of the comparator ($C_{B,N}^0$) at time 0, and inflation, such that:

$$\Delta C^0 = (C_{A,I}^0 + C_{A,N}^0 - C_{B,N}^0) \times 1.03^t$$

Hence a treatment will project an increase in incremental costs if total intervention costs are greater than the cost of other NHS costs of the comparator ($C^0_{A,I} + \Delta C^0_{A,N} > C^0_{B,N}$).

In this scenario, 9 out of 11 treatments project increased incremental costs over time. Both the treatments that show a decrease in incremental costs with inflation are already cost saving. Two treatments, in Meier et al. (2024) and Mallick and Carlton (2025), switched from cost-saving to more costly in years 7 and 9 respectively.

Figure A2 Incremental costs over time – Scenario 2

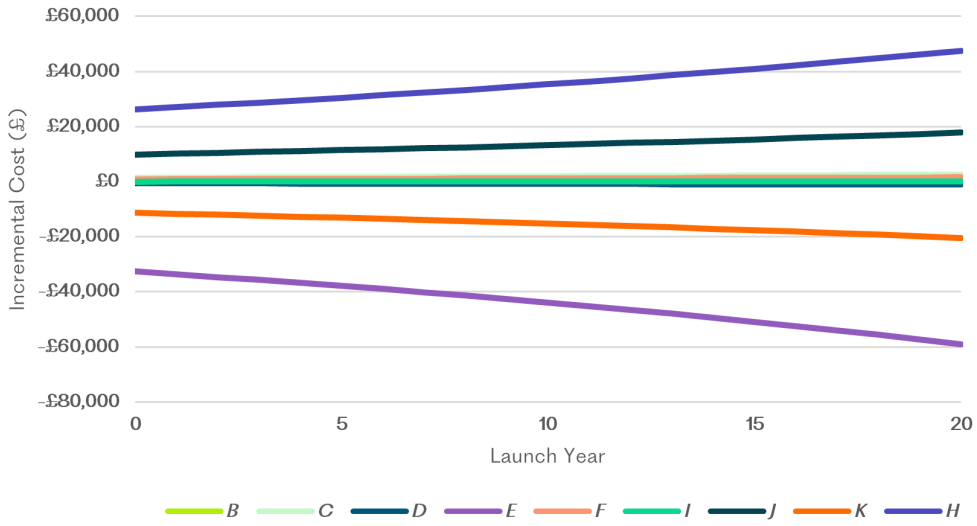


**Studies A and G were removed due to high incremental costs.*

Figure A3 shows the trend of incremental costs, under a uniform 3% inflation rate (Scenario 3), for each of the studies over a 20-year period. As all costs increase at a uniform rate, in this scenario incremental cost at time t (ΔC^t) is simply a function of inflation and incremental costs at time 0, such that $\Delta C^t = \Delta C^0 \times 1.03^t$. Hence, more costly new treatments will exhibit an increase in incremental costs over time, and cost-saving treatments will see a decrease in incremental costs over time. Therefore, all treatments remain in the same cost-effectiveness plane in time t as in time t=0.

7 out of the 11 treatments project increased incremental costs with inflation, with 4 showing decreases in incremental costs. All 4 treatments with decreasing incremental costs were cost saving at t=0, as shown in Figure A3.

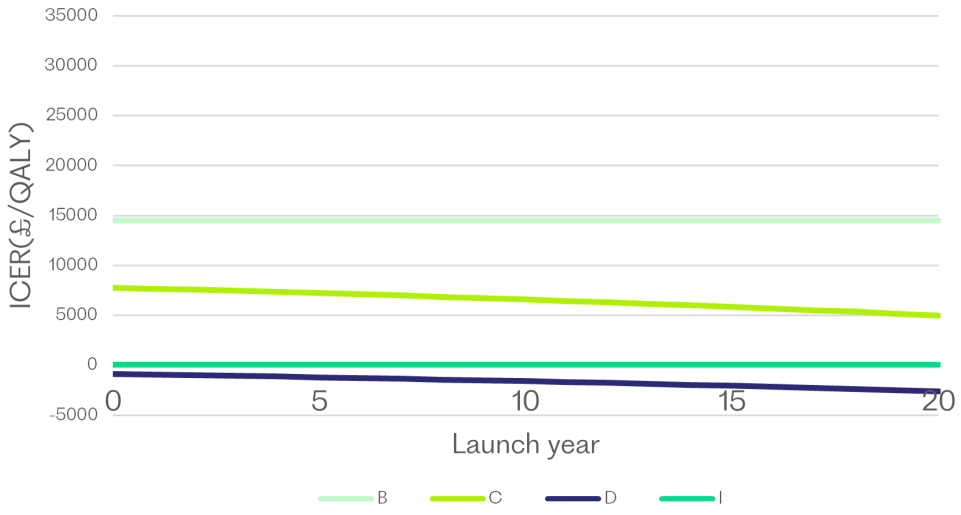
Figure A3 Incremental costs over time – scenario 3



**Studies A and G were removed due to high incremental costs.*

Figure A4 shows the relationship between ICER and inflation for all the treatments that were cost effective at a £30,000 per QALY ICER at t=0. In scenario 1, there was no change in decision making as a result of inflation over the 20-year time-period for the studies included in our analysis.

Figure A4 ICER and inflation - Scenario 1



**Meier (2024) removed from figure, as large high cost-saving treatment distorts results.*

In scenario 2, 3 out of the 5 treatments were still cost-effective at £20,000\QALY at t=20; Briggs (2025) crossed the ICER threshold in year (11), and Meier (2024) switched to not cost-effective in year 8.

In scenario 3, out of 5 treatments that were cost effective at t=0, 4 were still cost effective at £20k/QALY in year 20; the intervention in Briggs (2025) switched to not cost-effective in year 11.

Table A2 summarises decision rules across all case studies under each scenario, for both £20k and £30k per QALY thresholds.

Table A2 Inflation, ICERs and decision rules

		£20,000/QALY	£30,000/QALY
Scenario 1 (inflation of intervention costs = 0%, inflation of other NHS costs = 3%)	Treatment Cost Effective at T=0	5	5
	Treatment Cost Effective at T=20	5	5
Scenario 2 (inflation of intervention cost of comparators = 0%)	Treatment Cost Effective at T=0	5	5
	Treatment Cost Effective at T=20	3	4
Scenario 3 (all inflation = 3%)	Treatment Cost Effective at T=0	5	5
	Treatment Cost Effective at T=20	4	5

Appendix D: Economically justifiable price

Figure A5 EJP for breast cancer treatment at different threshold ICERs (2000 to 2030)

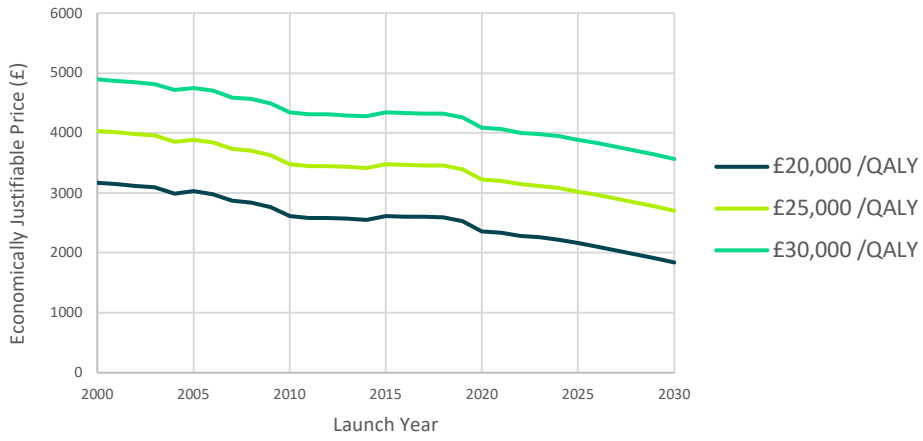


Figure A6 EJP for lymphoma treatment at different threshold ICERs (2000 to 2030)

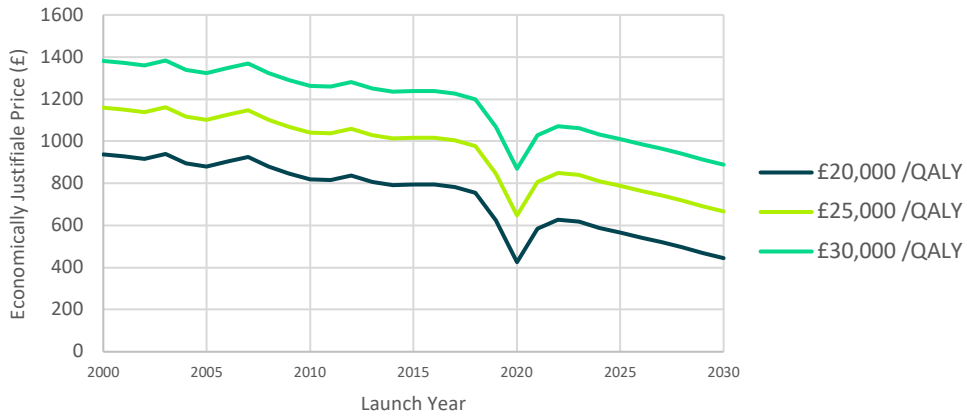
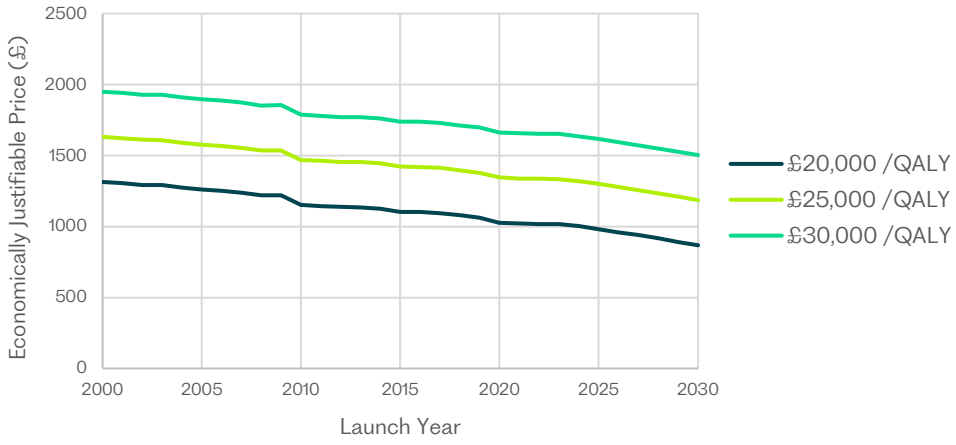


Figure A7 EJP for lung cancer treatment at different threshold ICERs (2000 to 2030)



Appendix E: Health state resource use

Table A3 Health state resource use – lymphoma

RESOURCE	HRG CODE	PROGRESSION-FREE	PROGRESSED DISEASE
Full blood count	DAPS05 (Total other currencies)	0.09	0.18
X-ray	DAPFI (Total other currencies)	0.02	0.02
Blood glucose	DAPS04 (Total other currencies)	0.01	0.00
LDH	DAPS04 (Total other currencies)	0.06	0.10
Lymphocyte counts	DAPS05 (Total other currencies)	0.09	0.18
Bone marrow exam	SA33Z (Total HRGs OP)	0.02	0.00
Haematologist	WF01A service code 303 CL (Outpatient Care)	0.09	0.18
Inpatient non-surgical/medical	SA31C-F (Total HRGs weighted average elective column)	0.01	0.04
Biopsy	FF51A-FF51E (Total HRGs weighted average non-elective short stay)	0.01	0.00
Blood transfusion	SA44A (OPROC SA44A service code 303)	0.02	0.08
Platelet infusion	SA44A (OPROC SA44A service code 303)	0.00	0.04
CT scan	RD22Z (Total HRGs Total cost) computerised tomography scan of one area, with pre and post contrast	0.04	0.04

** Progression-free and progressed disease states use a frequency of one week. Some HRG codes changed over time; appropriate equivalent codes were selected.*

Table A4 Health state resource use – breast cancer

RESOURCE	HRG CODE	PROGRESSION-FREE	PROGRESSED DISEASE
GP visit	PSSRU, table 9.4.2 - per surgery consultation lasting 9.22 minutes including direct care staff costs	0.23	0.34
Oncology specialist visit	WF01A service code 103 - Breast Surgery service (OP) Non-Admitted Face-to-Face Attendance, Follow-up	0.04	0.11
Clinical nurse specialist	PSSRU, table 9.2.1 - cost per working hour w/o qualifications, band 6	0.23	0.46
CT scan	RD24Z (Total HRGs)	0.08	0.08
Community nurse	PSSRU, table 9.2.1 - cost per working hour w/o qualifications, band 5	0.08	0.15
Social worker	PSSRU, table 10.1.1 - unit costs per hour, social worker (adult services)	0.11	0.11
Physiotherapist	PSSRU, table 8.2.1 - average of cost per working hour band 5 and 6 under annual and unit costs for community-based scientific and professional staff	0.00	0.11
Lymphoedema nurse	PSSRU, table 11.2.2 - cost per working hour including qualifications, band 6	0.00	0.11

** Progression-free and progressed disease states use a frequency of one week. Some HRG codes changed over time; appropriate equivalent codes were selected.*

Table A5 Health state resource use – lung cancer

RESOURCE	HRG CODE	PROGRESSION-FREE	PROGRESSED DISEASE
Outpatient visit	WF01A service code 800 - OP consultant led clinical oncology service	0.18	0.15
GP visit — surgery	PSSRU, table 9.4.2 - per surgery consultation lasting 10 mins with qualification (£4.94 per min)	0.23	0.00
GP visit — home	TA531 - cost per home visit including 11.4 minutes for consultations and 12 minutes for travel	0.00	0.50
Community nurse visit	PSSRU, table 9.2.1 - cost per working hour, band 8a, w/o qualification costs	0.17	0.17
Electrocardiogram	EY51Z (Total HRGs outpatient procedures)	0.02	0.02
Chest x-ray	DAPFI (Total other currencies)	0.13	0.12
Clinical nurse specialist	PSSRU, table 9.2.1 - cost per working hour, band 8b, w/o qualifications	0.23	0.23
CT scan (chest)	RD24Z (Total HRGs)	0.01	0.00
CT scan (other)	RD26Z (Total HRGs)	0.01	0.01
Therapist visit	PSSRU, table 10.3.1 - community occupational therapist (local authority)	0.00	0.50

** The progression-free and progressed disease health states use a frequency of one week. Some HRG codes changed over time. Pragmatic assumptions were made to choose the most appropriate equivalent codes.*

Appendix F: Model outputs

Table A6a Scenario analyses – incremental costs and ICERs 2000-2030

	LYMPHOMA (BASE CASE)		BREAST CANCER (BASE CASE)		LUNG CANCER (BASE CASE)		SCENARIO 1A - BREAST CANCER (LOWER HRS)		SCENARIO 1B - BREAST CANCER (HIGHER HRS)		SCENARIO 1C - BREAST CANCER (NO OS GAIN)		SCENARIO 1D - BREAST CANCER (NO OS GAIN AND LOWER PFS GAIN)		SCENARIO 1E - BREAST CANCER (LESS PPS)	
	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER	INCR. COSTS (£)	ICER
2000	36,673	24,794	22,620	23,900	20,743	23,639	13,904	41,833	46,986	19,705	19,426	982,308	12,780	2,857,352	42,094	42,470
2001	36,989	25,007	22,751	24,039	20,874	23,788	13,950	41,971	47,315	19,843	19,416	981,800	12,776	2,856,527	42,207	42,584
2002	37,338	25,244	22,896	24,192	21,019	23,953	14,000	42,124	47,678	19,995	19,405	981,239	12,772	2,855,615	42,331	42,709
2003	36,596	24,741	23,047	24,352	21,043	23,981	14,054	42,284	48,054	20,153	19,386	980,262	12,765	2,854,078	42,446	42,825
2004	38,128	25,777	23,617	24,953	21,303	24,277	14,253	42,885	49,484	20,752	19,348	978,326	12,751	2,850,896	42,945	43,329
2005	38,552	26,064	23,403	24,727	21,489	24,489	14,178	42,659	48,952	20,529	19,376	979,778	12,761	2,853,172	42,785	43,167
2006	37,733	25,510	23,661	25,000	21,609	24,626	14,268	42,930	49,608	20,804	19,376	979,773	12,760	2,853,032	43,045	43,430
2007	37,083	25,071	24,267	25,640	21,797	24,840	14,481	43,569	51,131	21,443	19,341	977,969	12,747	2,850,025	43,586	43,975
2008	38,566	26,073	24,421	25,803	22,069	25,150	14,535	43,732	51,519	21,606	19,330	977,419	12,743	2,849,125	43,720	44,111
2009	39,688	26,832	24,841	26,247	22,035	25,112	14,682	44,174	52,578	22,050	19,315	976,683	12,737	2,847,810	44,114	44,508
2010	40,618	27,461	25,652	27,104	22,988	26,198	14,967	45,031	54,601	22,898	19,226	972,164	12,705	2,840,647	44,757	45,157

2011	40,715	27,527	25,820	27,282	23,078	26,300	15,026	45,209	55,023	23,075	19,215	971,605	12,701	2,839,726	44,905	45,306
2012	39,971	27,023	25,839	27,302	23,190	26,427	15,032	45,229	55,070	23,095	19,212	971,451	12,700	2,839,486	44,918	45,320
2013	40,996	27,716	25,909	27,375	23,207	26,446	15,057	45,302	55,245	23,168	19,208	971,263	12,698	2,839,169	44,981	45,383
2014	41,538	28,083	26,016	27,488	23,324	26,581	15,094	45,415	55,511	23,280	19,193	970,517	12,693	2,838,001	45,060	45,463
2015	41,444	28,019	25,656	27,108	23,631	26,930	14,968	45,036	54,606	22,900	19,212	971,472	12,700	2,839,612	44,735	45,135
2016	41,466	28,034	25,725	27,181	23,680	26,985	14,993	45,109	54,778	22,973	19,204	971,082	12,698	2,838,995	44,790	45,190
2017	41,806	28,264	25,752	27,209	23,754	27,070	15,002	45,137	54,845	23,000	19,204	971,041	12,697	2,838,920	44,815	45,215
2018	42,715	28,879	25,776	27,235	23,996	27,345	15,010	45,163	54,902	23,024	19,194	970,542	12,694	2,838,163	44,820	45,220
2019	47,090	31,836	26,121	27,599	24,228	27,610	15,131	45,527	55,767	23,387	19,168	969,241	12,684	2,836,043	45,117	45,520
2020	53,721	36,319	27,053	28,584	24,704	28,153	15,458	46,511	58,102	24,366	19,091	965,343	12,656	2,829,743	45,906	46,316
2021	48,385	32,712	27,162	28,699	24,791	28,251	15,497	46,626	58,374	24,481	19,080	964,794	12,652	2,828,868	45,995	46,406
2022	46,981	31,763	27,487	29,043	24,837	28,304	15,611	46,969	59,192	24,824	19,061	963,854	12,645	2,827,297	46,286	46,700
2023	47,309	31,984	27,616	29,179	24,839	28,307	15,656	47,106	59,506	24,955	19,028	962,176	12,634	2,824,727	46,352	46,766
2024	48,330	32,674	27,831	29,407	25,057	28,555	15,732	47,333	60,050	25,184	19,024	961,958	12,632	2,824,291	46,560	46,976
2025	49,052	33,163	28,145	29,738	25,337	28,874	15,842	47,664	60,838	25,514	19,000	960,736	12,623	2,822,304	46,829	47,247
2026	49,802	33,670	28,472	30,083	25,627	29,204	15,956	48,008	61,655	25,857	18,975	959,466	12,614	2,820,240	47,108	47,529
2027	50,581	34,197	28,810	30,441	25,928	29,548	16,075	48,366	62,504	26,213	18,949	958,147	12,604	2,818,098	47,399	47,822

2028	51,390	34,744	29,162	30,812	26,241	29,904	16,198	48,737	63,386	26,582	18,921	956,778	12,594	2,815,873	47,700	48,126
2029	52,230	35,312	29,527	31,198	26,566	30,275	16,326	49,122	64,301	26,966	18,893	955,357	12,584	2,813,563	48,013	48,442
2030	53,103	35,901	29,906	31,599	26,903	30,659	16,459	49,522	65,251	27,365	18,864	953,881	12,573	2,811,164	48,338	48,770

Table A6b Scenario analyses – incremental costs and ICERs 2000-2030

	SCENARIO 1F - BREAST CANCER (MORE PPS)		SCENARIO 1G - BREAST CANCER (BETTER SOC PFS)		SCENARIO 2A - BREAST CANCER (LOW COST COMPARATOR £50)		SCENARIO 2B - BREAST CANCER (HIGH COST COMPARATOR £1500)		SCENARIO 3A - BREAST CANCER (IV SB12Z INTERVENTION)		SCENARIO 3B - BREAST CANCER (IV COMPARATOR SB12Z)		SCENARIO 3C - BREAST CANCER (IV TREATMENT AND COMPARATOR)	
	INCR. COSTS	ICER	INCR. COSTS	ICER	INCR. COSTS	ICER	INCR. COSTS	ICER	INCR. COSTS	ICER	INCR. COSTS	ICER	INCR. COSTS	ICER
2000	15,973	17,155	25,513	24,772	24,030	25,390	19,795	20,916	23,481	24,810	22,226	23,484	22,991	24,292
2001	16,111	17,302	25,609	24,865	24,167	25,535	19,926	21,054	23,638	24,976	22,339	23,604	23,139	24,448
2002	16,263	17,465	25,715	24,967	24,167	25,535	20,071	21,207	23,811	25,158	22,481	23,754	23,286	24,604
2003	16,427	17,641	25,797	25,047	24,319	25,695	20,222	21,367	23,990	25,348	22,616	23,896	23,453	24,780
2004	17,020	18,279	26,233	25,471	24,888	26,297	20,792	21,969	24,589	25,981	23,170	24,481	24,038	25,398
2005	16,787	18,029	26,122	25,363	24,674	26,070	20,578	21,742	24,405	25,786	22,940	24,239	23,838	25,187
2006	17,045	18,306	26,383	25,616	24,932	26,343	20,836	22,015	24,694	26,092	23,181	24,493	24,112	25,477
2007	17,673	18,980	26,865	26,085	25,538	26,983	21,442	22,656	25,332	26,766	23,834	25,182	24,675	26,071
2008	17,834	19,154	26,982	26,198	25,692	27,147	21,596	22,819	25,519	26,964	23,653	24,991	25,145	26,568
2009	18,262	19,613	27,353	26,558	26,112	27,590	22,016	23,262	25,973	27,443	24,139	25,505	25,501	26,944
2010	19,131	20,546	27,846	27,037	26,923	28,447	22,827	24,119	26,819	28,337	25,000	26,414	26,266	27,753
2011	19,306	20,734	27,976	27,163	27,091	28,625	22,995	24,297	26,944	28,469	25,264	26,693	26,344	27,835

2012	19,327	20,757	27,984	27,171	27,110	28,645	23,014	24,317	26,935	28,459	25,402	26,840	26,251	27,736
2013	19,399	20,834	28,041	27,226	27,180	28,718	23,084	24,390	27,010	28,539	25,443	26,883	26,347	27,838
2014	19,516	20,959	28,095	27,279	27,287	28,831	23,191	24,503	27,251	28,793	25,492	26,934	26,509	28,009
2015	19,145	20,561	27,800	26,993	26,928	28,452	22,831	24,124	26,967	28,494	25,094	26,515	26,185	27,667
2016	19,219	20,640	27,842	27,033	26,997	28,525	22,901	24,197	27,020	28,550	25,234	26,662	26,188	27,670
2017	19,245	20,669	27,866	27,056	27,023	28,552	22,927	24,225	27,074	28,606	25,259	26,689	26,215	27,699
2018	19,276	20,702	27,854	27,044	27,047	28,578	22,951	24,250	27,031	28,561	25,257	26,687	26,264	27,750
2019	19,637	21,090	28,109	27,292	27,392	28,942	23,296	24,614	27,442	28,996	25,495	26,938	26,709	28,221
2020	20,618	22,143	28,769	27,933	28,324	29,927	24,228	25,599	28,610	30,230	26,259	27,745	27,800	29,374
2021	20,734	22,268	28,840	28,002	28,433	30,043	24,337	25,715	29,144	30,794	26,576	28,080	27,714	29,282
2022	21,071	22,630	29,101	28,255	28,758	30,386	24,662	26,058	29,059	30,704	26,874	28,395	28,065	29,653
2023	21,222	22,792	29,110	28,264	28,888	30,523	24,791	26,195	29,875	31,566	27,187	28,725	28,021	29,607
2024	21,439	23,025	29,312	28,460	29,103	30,750	25,007	26,422	29,993	31,690	27,108	28,642	28,512	30,126
2025	21,769	23,379	29,541	28,683	29,417	31,082	25,321	26,754	30,372	32,091	27,394	28,945	28,852	30,485
2026	22,111	23,746	29,779	28,914	29,743	31,426	25,647	27,098	30,764	32,506	27,692	29,259	29,205	30,858
2027	22,466	24,127	30,026	29,154	30,081	31,784	25,985	27,456	31,172	32,936	28,000	29,585	29,572	31,246
2028	22,834	24,523	30,283	29,403	30,433	32,155	26,337	27,827	31,594	33,382	28,321	29,924	29,953	31,648

2029	23,217	24,935	30,549	29,661	30,798	32,541	26,702	28,213	32,032	33,845	28,654	30,275	30,349	32,066
2030	23,615	25,362	30,826	29,930	31,177	32,942	27,081	28,614	32,487	34,325	28,999	30,641	30,759	32,500

Table A7 Scenario analyses – key figures

	2000		2024				2030			
	ICER (£/QALY)	EJP AT £25K THRESHOLD (£)	ICER (£/QALY)	CHANGE IN ICER (SINCE 2000)	EJP AT £25K THRESHOLD (£)	CHANGE IN EJP AT £25K THRESHOLD	ICER (£/QALY)	CHANGE IN ICER (SINCE 2000)	EJP AT £25K THRESHOLD (£)	CHANGE IN EJP AT £25K THRESHOLD
Lymphoma (base case)	24,794	1,159	32,674	31.79%	809	-30.18%	35,901	44.80%	666	-42.54%
Breast cancer (base case)	23,900	4,032	29,407	23.04%	3,081	-23.57%	31,599	32.21%	2,703	-32.96%
Lung cancer (base case)	23,639	1,631	28,555	20.80%	1,319	-19.14%	30,659	29.70%	1,185	-27.33%
Scenario 1a - breast cancer (lower HR, 0.25)	41,833	2,336	47,333	13.15%	1,844	-21.06%	49,522	18.38%	1,648	-29.44%
Scenario 1b - breast cancer (higher HR, 0.75)	19,705	5,026	25,184	27.80%	3,801	-24.38%	27,365	38.87%	3,313	-34.08%
Scenario 1c - breast cancer (no OS gain)	982,308	389	961,958	-2.07%	463	18.86%	953,881	-2.89%	491	26.34%
Scenario 1d - breast cancer (no OS gain and lower PFS gain)	2,857,352	433	2,824,291	-1.16%	473	9.20%	2,811,164	-1.62%	488	12.85%
Scenario 1e - breast cancer (less PPS gains)	42,470	2,218	46,976	10.61%	1,799	-18.89%	48,770	14.83%	1,632	-26.41%
Scenario 1f - breast cancer (more PPS gains)	17,155	5,808	23,025	34.22%	4,337	-25.33%	25,362	47.84%	3,751	-35.41%
Scenario 1g - breast cancer (better SoC PFS)	24,772	1,159	28,460	14.89%	1,015	-12.45%	29,930	20.82%	957	-17.41%
Scenario 2a - breast cancer (low cost comparator £50)	25,390	3,775	30,750	21.11%	2,850	-24.51%	32,942	29.74%	2,471	-34.53%
Scenario 2b - breast cancer (high cost comparator £1500)	20,916	4,547	26,422	26.33%	3,597	-20.90%	28,614	36.81%	3,218	-29.22%
Scenario 3a - breast cancer (IV SB12Z intervention)	24,810	3,875	31,690	27.73%	2,687	-30.65%	34,325	38.36%	2,232	-42.39%
Scenario 3b - breast cancer (IV comparator SB12z)	23,484	4,104	28,642	21.97%	3,213	-21.70%	30,641	30.48%	2,868	-30.10%
Scenario 3c - breast cancer (IV treatment and comparator)	24,292	3,964	30,126	24.01%	2,957	-25.40%	32,500	33.79%	2,547	-35.74%

CONTRACT RESEARCH REPORT
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