

Did you just get a NICE increase in price potential? Severity multipliers and price potential in England

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BACKGROUND

- ▶ In cost-utility analyses all Quality-Adjusted Life Years (QALYs) are equal to decision makers
 - This allows to compare the cost-effectiveness of treatments like-for-like across a wide range of conditions
 - It also facilitates a decision-making process that strives to maximise the number of QALYs gained for a fixed healthcare budget, regardless of the patients' condition or symptom severity
- ▶ However, evidence suggests that society may prioritise health gains for the most severe conditions, instead of distributing QALY gains equally across all conditions¹
- ▶ Therefore, the National Institute for Health and Care Excellence (NICE) has updated their Health Technology Assessment (HTA) guidance to replace end-of-life criteria with severity modifiers that consider the quality of life under the current standard of care

The Severity Multiplier System

- ▶ Severity modifiers are set with QALY weights of x1.2 and x1.7 which are applied to the standard willingness to pay (WTP) threshold of up to £30,000 per QALY gained (Table 1)
- ▶ The severity modifier will be applied based on the proportional or absolute QALY shortfall, whichever results in the greatest multiplier

Table 1. Criteria for establishing which severity multiplier is applied

Severity multiplier	Equivalent maximum threshold	Absolute QALY shortfall (number of lost QALYs)	Proportional shortfall (proportion of QALYs lost)
x1	£30,000	<12	<85%
x1.2	£36,000	≥12, <18	≥85%, <95%
x1.7	£50,000	≥18	≥95%

Abbreviations: QALY, quality-adjusted life year

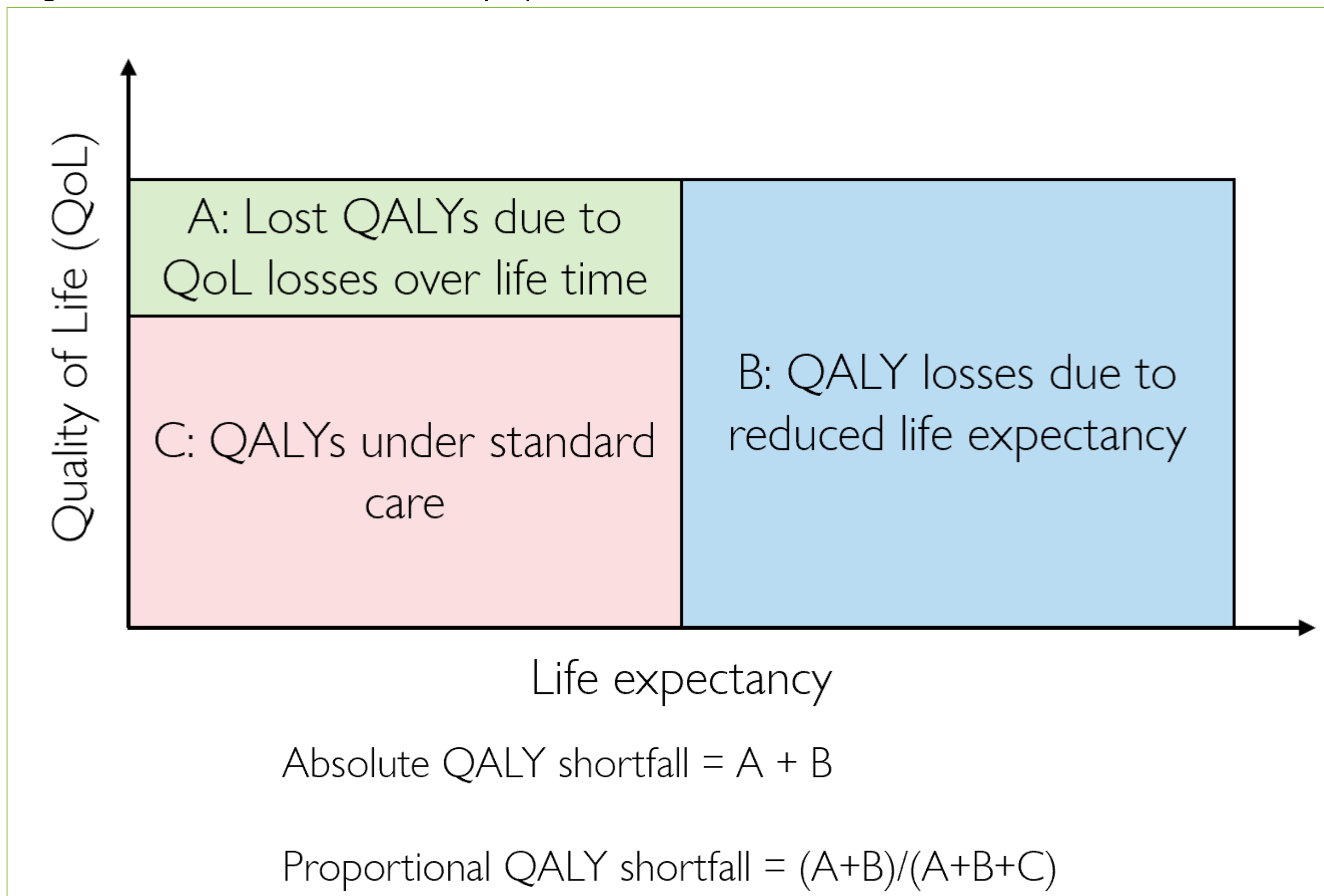
Note: The applied severity multiplier is the greatest based on either absolute or proportional shortfall.

Source: Adapted from NICE

Calculating the QALY shortfall

- ▶ Proportional and absolute QALY shortfalls are calculated as following (Figure 1):
 - Absolute QALY shortfall: total amount of future health expected to be lost due to the condition
 - Proportional QALY shortfall: percentage of QALYs that people lose relative to their remaining quality adjusted life expectancy (QALE)

Figure 1. Illustration of absolute and proportional QALY shortfalls



Abbreviations: QALY, quality-adjusted life year; QoL, quality of life

Note: This illustration omits a lifetime trend of reducing quality of life and discounting.

OBJECTIVE

- ▶ Our objective was to understand how the change in NICE methodology will impact price potential in England

METHODS

- ▶ We investigated updated NICE interim WTP thresholds to understand how the new methodology is being implemented
- ▶ We reviewed previous NICE HTAs to identify cases for which the maximum WTP threshold would have changed if current severity modifiers were applied

RESULTS

- ▶ We identified one example each for an increased and decreased price potential, respectively, if severity modifiers were applied

Decreased pricing potential

- ▶ Eribulin (TA515², Table 2) is a treatment for locally advanced or metastatic breast cancer after one prior chemotherapy regimen, especially in the HER2-negative subpopulation
- ▶ While Eribulin met the end-of-life criteria allowing for a WTP threshold of up to £50,000 per QALY, using the new Severity Multipliers the WTP threshold would be reduced to £36,000

Increased pricing potential

- ▶ Rifluridine–tipiracil (TA669³, Table 2) is a third line treatment for metastatic gastric or gastro-oesophageal junction cancer
- ▶ Rifluridine–tipiracil did not meet end-of-life criteria in the past and had a WTP of £30,000; when using Severity Multipliers, its WTP threshold would increase to £50,000

Table 2. Changes in the WTP threshold for selected historical technology appraisals

Prior Technology appraisal	End-of-life criteria			Severity multipliers			
	<2 years survival under SoC	≥3 month incremental survival benefit	Previous maximum threshold	QALEs under SoC	QALEs general population	Applicable multiplier ^a	New maximum threshold
TA515 ^b	✓	✓	£50,000	0.95	14.75	x1.2	£36,000
TA669	✓	×	£30,000	0.33	11.38	x1.7	£50,000

Abbreviations: QALE, quality-adjusted life expectancy; SoC, standard of care

Notes: ^aThe applied severity multiplier is the greatest based on either absolute or proportional shortfall. ^bHER2-negative sub-population only

DISCUSSION

- ▶ These method changes have put a focus on increasing health gains in the most severe conditions
- ▶ As the changes for end-of-life criteria to severity multipliers are intended to be budget neutral, price potential for some therapies will increase for some and decrease for others
- ▶ Very rare conditions with high unmet needs typically proceed down the highly specialised technology appraisal route. Therefore, types of treatment that most benefit from these criteria are still likely to be oncology treatments, similar to the previously applied end-of-life criteria. Although severity multipliers will remain highly applicable to oncology treatments, as our examples show, WTP thresholds may change in certain indications
- ▶ The introduction of severity multipliers may increase uncertainty and disputes over which multiplier applies in comparison to the previous end-of-life criteria, because the calculation now relies on three main parameters that may affect eligibility instead of just life-years:
 - The source of QALEs for the general population – we are aware of multiple sources of QALE estimates for the English population. While NICE has not published a preference for any particular source, a Decision Support Unit report recommended the use of QALE estimates based on 2017–2019 life tables and EQ-5D-3L utilities derived from 2014 Health Survey of England data⁴
 - Time in health states – uncertainty in transition probabilities and/or survival extrapolations may result in substantial changes in shortfall estimates when calculating shortfalls from trial data
 - Health state utilities – eligibility may differ depending on the source of health-state utility values
- ▶ Eligibility may differ depending on the source of health-state utility values
- ▶ We recommend that companies and appraisal committees explore the likelihood of being cost-effective via probabilistic analysis in terms of net monetary benefit
- ▶ This would explicitly incorporate the severity multiplier into the decision analytic model

CONCLUSIONS

- ▶ Going forward, quality-adjusted life expectancy of the general population, and shortfalls in both life expectancy and quality of life under current standard of care for a health condition will determine the applicable WTP threshold
 - As the number of determining factors increases, under certain circumstances, sufficient uncertainty in one or more of these factors could lead to disputes over which modifier applies
- ▶ Greater clarity is required to support the identification of the applicable modifier, and methods to explicitly incorporate uncertainty of the applying multiplier within modelling should be explored

REFERENCES

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- 4 Hernández Alava M., Pudney S., Wailoo A. Estimating EQ-5D by Age and Sex for the UK. NICE DSU Report. 2022

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