USING AN EFFICIENCY FRONTIER APPROACH TO GENERATE VALUE-BASED PRICE ESTIMATES FOR A TRANSFORMATIONAL TPP

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BACKGROUND

- The price potential of a new health care asset may be estimated in a number of ways
  - The **efficiency frontier approach** describes the net costs and value of an asset's additional benefits in an efficiency plot as systematically used in HTA assessments in Germany
  - The **economically justified price** (EJP) informs on the price at which assets may achieve HTA approval based on a cost-utility analysis approach, as adopted by the National Institute for Health Care and Excellence (NICE) in the UK and the Institute of Clinical and Economic Review in the US
  - The **value justified price** (VJP) informs on the price payers are likely to pay for a new treatment in each line of therapy
- This poster will outline how to establish the **efficiency frontier justified price** (EFJP) potential of hypothetical assets based on their transformational TPPs (the asset's high-end expected outcomes) and positions in the rheumatoid arthritis (RA) treatment pathway

APPROACH AND METHODOLOGY

The efficiency frontier and the EFJP

- The efficiency frontier approach informs decision makers about efficiency of interventions in terms of their net costs and value of additional benefits in the context of relevant other interventions in that indication.
  - To facilitate guidance regarding price potential for reimbursement, this information is presented in an efficiency plot with costs on the horizontal axis and value of benefits on the vertical
  - A technology that places on the frontier or to the left is reasonably efficient, while one falling to the right requires further justification for reimbursement at that price
- A method for estimating an EFJP was developed, based on the methods for economic evaluation published by the Institute for Quality and Efficiency in Health Care (IQWiG)[1].

- The efficiency frontier concept is based upon the incremental cost-effectiveness ratios (ICERs) of moving from one intervention to another (Figure 1)
  - Before forming the efficiency frontier, all current treatments reimbursed by payers are plotted in terms of their net present benefits and costs. The gradient of a line connecting any two options gives the rate of gain per additional unit of cost if all patients were moved from one therapy to the other
- Tracing out the efficiency frontier demonstrates the lowest ICERs of moving patients to another (more beneficial) treatment (Figure 2)
  - B is absolutely dominated by C. D is absolutely dominated by E and F (absolute dominance = when a treatment delivers additional value for no incremental costs and/or equivalent value for lower costs)
  - E is extended dominated (extended dominance=when a weighted average of two interventions delivers additional value for no incremental costs and/or equivalent value for lower costs.
- Extrapolating the last ICER on the current frontier establishes the EFJP for new superior treatments (Figure 2)
- For new non-superior interventions
  - **On the EJFP:** price potential is maximised
  - **To the right:** the price exceeds the EFJP
  - **To the left:** the price is below the EFJP
- The flatter the gradient of the efficiency frontier, the higher the ICER of substituting from one treatment on the efficiency frontier to the next
- Therefore, the ICER between the last two treatments on the efficiency frontier always has the highest observed ICER on the efficiency frontier*

Figure 1. ICERs of moving from one intervention to another (A – G: currently available treatment strategies)

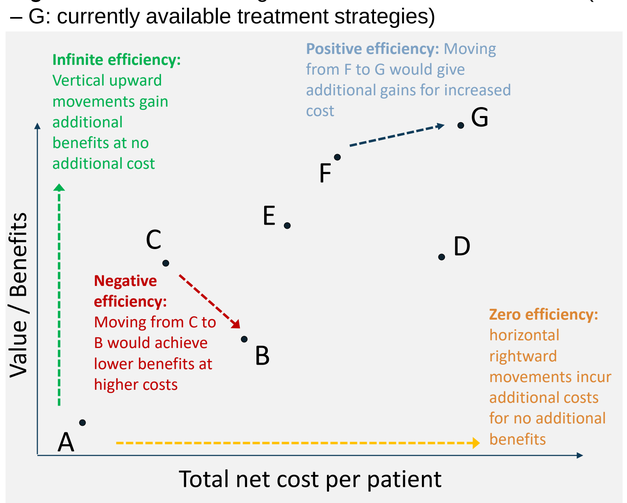
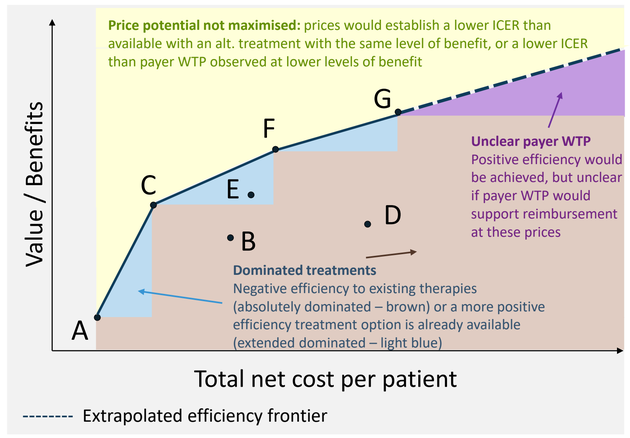


Figure 2. Scenarios of the cost-benefit plane corresponding to different new non-superior treatment placements



- The efficiency frontier is specific to the given measure of benefit (represented on the vertical axis)
- For the purpose of this work, the number of periods spent in either European League Against Rheumatism (EULAR)† good response or remission is taken as the base case. Scenario analyses will indicate a plausible range for the EFJP. Potential other measures of benefit to consider are, for a state-transition cohort economic model:
  - Remission (discounted periods spent in state)
  - QALYs (discounted lifetime averages)
  - Health Assessment Questionnaire Disability Index (HAQ-DI) (discounted lifetime averages)

RESULTS

- Scenarios from the US and UK markets were conducted and varied by intervention (i.e. different comparator treatment sequences), position on the formulary, and whether or not patients had been treated before with targeted immunomodulators (TIMs). An example is shown in Figure 3
- EFJPs for each scenario were generated using 4 different measures of benefit (EULAR good response or remission, remission, QALYs or HAQ-DI) and compared to VJPs and EJPs

Figure 3. Example scenarios tested in the economic analysis

Parameter	US (scenario A)	UK (scenario B)
Time horizon	20-year	20-year
Intervention	Base RA TPP	Base RA TPP
Position on formulary	Preferred products	Before JAKs
Prior treatment	TIM-naïve	TIM-treated
RA severity	Moderate to severe	Severe

- This method considers all relevant comparators simultaneously. Therefore, unlike for the EJP or VJP analysis, scenarios are not defined by a single comparator.
- Figure 5 shows the efficiency frontier from scenario A above, where EULAR good response or remission is used as a measure of benefit and where A-K represent the different treatments. The associated intervention has an average benefit of 7.8 years, leading to a total cost of around $844k. It was deemed that a treatment cost of $81,294/year corresponds to this figure. This leads to an EFJP of $81,294/year.
- The gradient of the extrapolated efficiency frontier in Figure 4 indicates that the implied ICER for a year of additional benefit with the intervention is $235,000. The implied ICER when QALYs are used as a measure of benefit is $1.9m, which suggests the acceptable threshold in the US is higher than the thresholds applied by the Institute of Clinical and Economic Review.
- The chosen measure of benefit has a large impact on the EFJP. Ranging from a $81,294 annual treatment cost in scenario A, to $111,757 when QALYs are used as a measure of benefit (Figure 5).
- EFJPs can be significantly greater than existing comparator costs and the VJP and EJP estimates

Figure 4. Efficiency frontier for scenario A, leading to an EFJP of $81,294/year

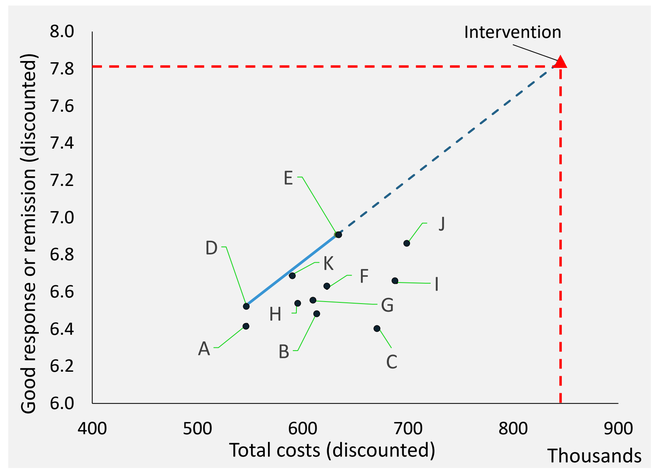
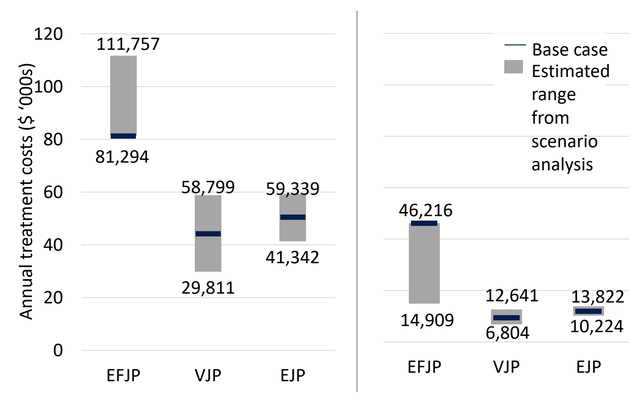


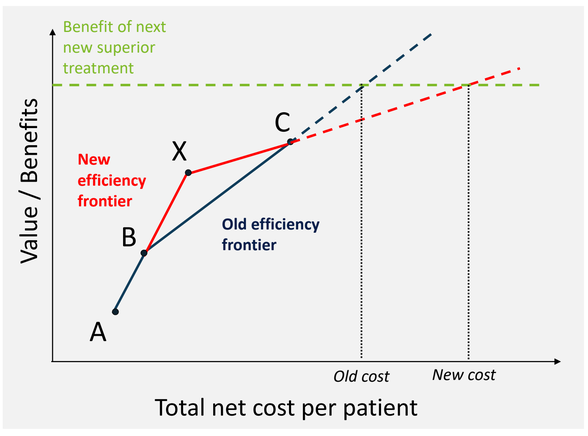
Figure 5. EFJPs, VJPs and EJPs for scenario A (left) and scenario B (right)



LIMITATIONS

1. There is no single measure of benefit to be used on the vertical axis of the efficiency frontier plot that is 'gold-standard'.
2. The EFJP assumes a constant WTP for incremental benefits.
3. As treatments are rarely delisted when new treatments are approved, ICERs between points on the efficiency frontier may represent legacy decisions and do not reflect incremental WTP for further improved benefits. (Figure 6)

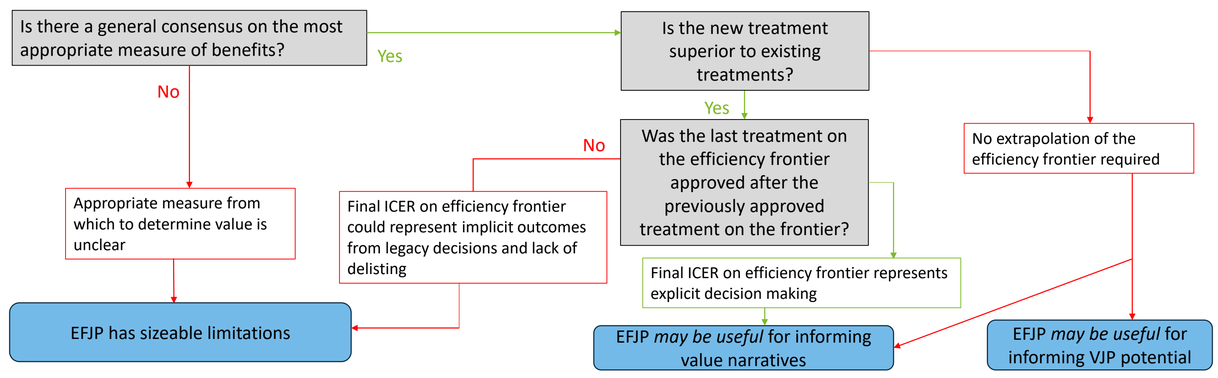
Figure 6. Effect on implied WTP with the addition of a new non-superior treatment X



- Treatment X re-defines the efficiency frontier. The implied WTP, assuming that C is not delisted, is now greater between X and C, than between B and C. This impacts the price potential of new superior treatments. However, delisting old treatments when new ones enter the market is not commonly practised.

CONCLUSIONS

- The EFJP method has two key potential uses when there is general consensus on the most appropriate measure of benefits:
  - For new non-superior treatments – it establishes where benefits are delivered at an efficient price compared to alternatives
  - For new non-superior treatments, or for new superior treatments where the efficiency frontier represents previous explicit decisions – comparisons between the submission price to the EFJP can be used within the value narrative to justify the value of the product at the submission price relative to alternatives and historic decisions.
- The flowchart below outlines a complete recommendation process on the validity of the EFJP



REFERENCES

1. IQWiG – General methods, version 6.0 November 2020, https://www.iqwig.de/methoden/general-methods_version-6-0.pdf

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*If it didn't, one of the treatments would be absolutely or extendedly dominated
†The EULAR response criteria classify individual patients as non-, moderate, or good responders, dependent on the extent of change and the level of disease activity reached

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