Feasibility of Distributional Cost-Effectiveness Analysis (DCEA) Across Five Countries

Naylor R[1], Fewster H[1], Hyde B[1], Malcolm R[1], Holmes H[1]

[1] York Health Economics Consortium, University of York, York, YO10 5NQ

INTRODUCTION

Aggregate distributional cost-effectiveness analysis (DCEA) calculates the distribution of incremental costs and health outcomes across socioeconomic groups, providing equity considerations not previously addressed in conventional cost-effectiveness analysis (CEA).

The National Institute for Health and Care Excellence (NICE) released a position statement in 2025 supporting DCEA's inclusion in non-reference case analysis, and reducing health inequalities is one of six priorities in its 2021-2026 strategy.

Conducting an aggregate DCEA (Figure 1) first involves extracting average incremental discounted QALYs and costs from a conventional cost-effectiveness analysis model. The target population size and its distribution by socioeconomic status, age, and sex are then estimated using healthcare datasets. Population health benefits and costs (converted to health opportunity costs) are then calculated and distributed. Finally, the net health benefit is calculated, and inequality measures are used to evaluate changes in health inequality and total health.

Appropriate data exists in the UK to conduct an aggregate DCEA. However, this study involved conducting a literature search in five countries (Australia, Brazil, Canada, India, and Spain) to identify equivalent data sources that would enable an aggregate DCEA.

This poster reports the results of a feasibility assessment, including the available data relevant to a DCEA identified in each country.

METHODS

A series of targeted and pragmatic search approaches were used to identify possible data sources between October and December 2024. Searches were conducted using Governmental/National websites, Global Health Data Exchange, Joint programming Initiative, EuroStat, OECD Health Statistics 2024, HTA decision maker websites, published literature reviews, Ovid Medline and targeted web searches. The following seven areas were part of the aggregate DCEA feasibility literature search:

1. Routine datasets reporting healthcare utilisation
2. Major population health survey
3. Data on inequalities or deprivation by geographic area
4. National thresholds for cost per QALY and associated empirical evidence
5. Evidence on baseline inequalities in lifetime health
6. Evidence related to the distribution of health opportunity costs
7. Evidence elated to inequality aversion parameter

Figure 1: Stages of a DCEA
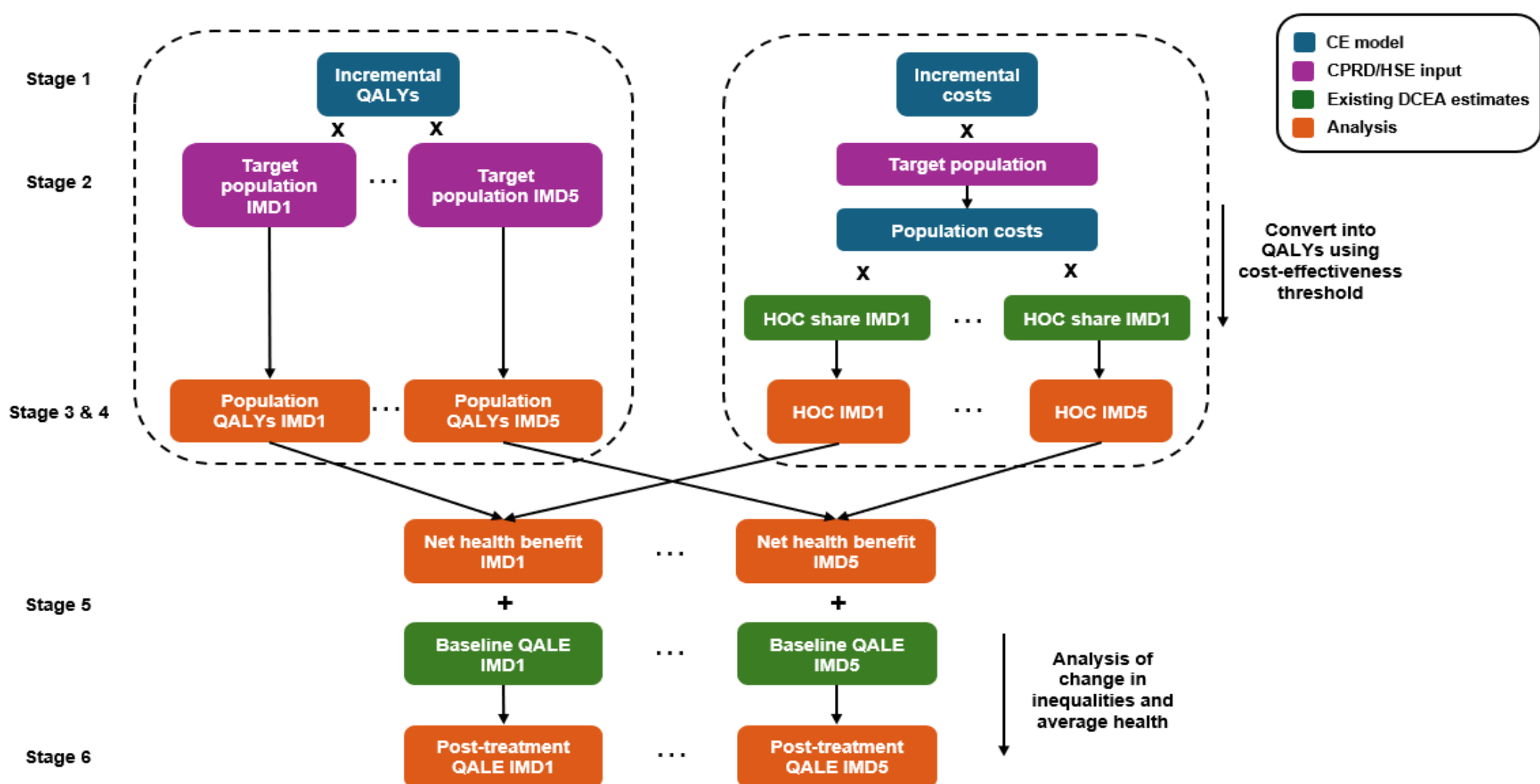
Key: CE – Cost-effectiveness; CPRD – Clinical Practice Research Datalink; DCEA – Distributional Cost-Effectiveness Analysis; HOC – Health Opportunity Cost; HSE – Health Survey for England; IMD – Index of Multiple Deprivation; QALE – Quality-Adjusted Life Expectancy; QALY – Quality-Adjusted Life Years

RESULTS

Table 1 summarizes data availability by country using a traffic light system. Green indicates adequate data. Orange indicates that partial data were available or that assumptions were required for a DCEA. Red indicates no appropriate data sources were identified, preventing analysis.

Healthcare utilisation (HCU) data availability varies substantially by country. Patient-level datasets were identified and deemed accessible in Australia and Canada. While Brazil maintains patient-level HCU data, it is difficult to access, necessitating further investigation. India provides tabulated HCU indicators, but accessibility is unclear. Spain's HCU data (RAE-CMBD) requires a request to the Ministry of Health. No simplifying assumptions can be made in place of missing data here.

Data on deprivation by geographic area exhibited the most heterogeneity across countries, with adequate data for Australia and Canada and partial data for Brazil and India. In their respective indices, Australia and Canada share education, employment, and family structure as measures of deprivation. All four countries use income, but its index categorisation varies.

Table 1: Summary of available DCEA data in target countries

	Australia	Brazil	Canada	India	Spain
Healthcare utilisation	🟢	🟠	🟢	🟠	🟠
Population health survey	🟢	🟢	🟢	🟢	🟢
Deprivation by geographic area	🟢	🟠	🟢	🔴	🟠
Empirical health opportunity cost threshold	🟢	🟠	🟢	🟠	🟢
Distribution of health benefits	🟠	🔴	🟠	🔴	🟠
Distribution of health opportunity costs	🔴	🔴	🔴	🔴	🔴
Inequality aversion parameter	🟢	🟠	🟢	🟠	🟠
Overall	**Overall** (green)	**Overall** (orange)	**Overall** (orange)	**Overall** (red)	**Overall** (orange)

Key: Green shading indicates that adequate data sources are available for DCEA. Orange shading indicates that partial data are available or strong assumptions are required. Red shading indicates that no appropriate data are available for DCEA.

CONCLUSION

The findings of this feasibility report suggest that it may be possible to carry out a DCEA in the selected five countries except India, with varying levels of assumptions.

Healthcare utilisation, population health, and deprivation data accessibility vary across countries, and access often requires approval from a statutory statistical organisation, incurring variable financial and time costs. Future research should consider conducting DCEAs in target countries of interest.

REFERENCES

1. Cookson et al. *Value in Health*. 2017;20(1):206-12. **2.** Asaria et al. *Medical Decision Making*. 2016;36(1):8-19 **3.** Ward et al. *PharmacoEconomics*. 2021:1-20. **4.** Love-Koh et al. *Value in Health*. 2015;18(5):655-62. **5.** Woods et al. *Value in Health*. 2016;19(8);929-35.

CONTACT US

✉ rob.malcolm@york.ac.uk

📞 +44 1904 323620

🖱 www.yhec.co.uk

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