



Centre for Health
Economics Research
and Evaluation (CHERE)



Including health equity considerations in economic evaluations

About CREST

The Centre for Health Economics Research and Evaluation (CHERE) at UTS has been contracted by Cancer Australia to establish a dedicated Cancer Research Economics Support Team (CREST) to provide high quality, expert advice support to the Cancer Australia Cooperative Trials Groups (CTGs).

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Summary

- Healthcare resource allocation and priority setting typically consider clinical effectiveness, cost-effectiveness, and budget impact. Health equity considerations are increasingly important in decision-making. Currently, health equity is not systematically or quantitatively evaluated as part of that decision-making.
- Distributional cost-effectiveness analysis quantitatively analyses the equity impacts of health interventions and the trade-offs that can arise between equity and efficiency.
- Equity analysis is 'data hungry' and requires reporting of data according to equity-relevant strata from clinical trials and observational studies.



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Healthcare priority setting: balancing competing demands

Australia enjoys one of the longest life expectancies at birth (1). While it does not rank highest in terms of healthcare expenditure as a proportion of gross domestic product, at 10.5%, it is ranked 15th among OECD nations in terms of its healthcare spending (2). Deciding how that expenditure will be allocated across competing healthcare demands requires careful consideration.

In Australia, health technology assessment (HTA) authorities, like the Pharmaceutical Benefits Advisory Committee (PBAC) and Medical Services Advisory Committee (MSAC), advise the Federal Government on which health care is suitable for public subsidy. Typically, these judgements rely on assessments of clinical efficacy, safety, cost-effectiveness and overall financial impact (3, 4). However, other less quantifiable factors affect the decisions being made, including confidence in the evidence presented, unmet needs, disease severity, potential targeted benefit, public health issues, and equity (3, 4).

Achieving equity of health outcomes has been deemed a priority in Australia, particularly for First Nations people (5). The World Health Organisation (WHO) defines health equity as 'the absence of unfair, avoidable or remediable differences [in health status] among groups of people, whether those groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality (e.g. sex, gender, ethnicity, disability, or sexual orientation)' (6). Currently, how health equity may be affected by a new health care technology or service is typically not systematically or quantitatively evaluated in HTA applications.

Health equity in Australia

Although Australians on average have some of the best levels of health globally, this is not evenly distributed with a 'social gradient of health' existing; that is, the higher a person's socioeconomic position, the healthier they tend

to be (7). This gradient is observed by health risk factors, chronic conditions, mortality, and burden of disease, among others (7).

The association between socioeconomic disadvantage and health can explain a substantial part of the health gap between First Nations people and non-Indigenous Australians (4). This is particularly evident in cancer, where First Nations people are more likely to be diagnosed with cancer and are approximately 40% more likely to die from cancer compared to non-Indigenous Australians (8). While advancements in screening and treatment have led to improved cancer survival outcomes on average, the gap between First Nations people and non-Indigenous Australians is widening (8).

In response, Cancer Australia through the Australian Cancer Plan, has outlined a strategic objective to improve equity in cancer outcomes for First Nations people (9). Socio-economic status (using Index of Relative Socio-Economic Disadvantage classification [IRSD] (7))¹, and rural/remote status may also be considerations of interest where improvements in equity are needed (9).

Methods to integrate health equity considerations in economic evaluations

Equity-relevant considerations can vary in different settings and decision contexts. For example, the Guidance on Priority Setting in Health Care (GPS-Health) from the WHO, maps equity considerations that can potentially be included in priority setting alongside typical cost-effectiveness analysis (CEA) (10). These criteria are presented in box 1.

¹ Relative Socio-Economic Disadvantage classifies individuals into quintiles of socioeconomic disadvantage based on attributes of the geographical area in which they live, including income levels, educational attainment, unemployment rates and jobs in relatively unskilled occupations.

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Box 1: GPS–health related criteria alongside CEA

Disease and intervention:

- Severity.
- Realisation of potential.
- Past health loss.

Social groups:

- Socioeconomic status.
- Area of living.
- Gender.
- Race, ethnicity, religion and sexual orientation.

Protection against the financial and social effects of ill health:

- Economic productivity.
- Care for others.
- Catastrophic health expenditures.

In recent years, there have been efforts to introduce different tools to systematically and quantitatively integrate health equity considerations into CEA including (11, 12):

- Equity-based weighting applied to health benefits or decision thresholds to give more priority to disadvantaged groups.
- Extended cost-effectiveness analysis (ECEA) which incorporates financial risk protection within relevant equity criteria. This is more commonly used in countries without universal health coverage where out-of-pocket expenditure is higher.
- Multi-criteria decision analysis (MCDA) which can include equity alongside other decision criteria as required by reimbursement decision-makers.
- Mathematical programming which optimises an attribute (e.g., efficiency) given predefined constraints (e.g., equity considerations).

- Distributional cost-effectiveness analysis (DCEA) which quantitatively analyses the equity impacts of health interventions and the trade-offs that can arise between equity and efficiency, while evaluating the health opportunity costs (HOC), i.e., the health benefits of those who miss out on other interventions that could have been potentially funded at the population level

The remainder of this factsheet focuses on DCEA, given that equity-based weighting is typically determined by the decision-maker (e.g., the National Institute for Health and Care Excellence (NICE) in England and Wales uses weights for disease severity (13)), MCDA is a more general technique that can use inputs from DCEA, ECEA can be considered a subset of DCEA mainly focused on financial risk protection, and mathematical programming is less useful for incremental analysis (14).

DCEA - a primer

DCEA can be considered as an extension of decision analytics models within CEA (15). Its implementation is summarised as:

- Add model inputs (to the CEA) stratified by equity considerations relevant to the reimbursement decision-making context. Within a DCEA, health benefits are typically presented as quality-adjusted life years (QALYs), the preferred CEA outcome within HTA in Australia (3).
- Convert total incremental costs into forgone QALYs to represent the HOC based on the willingness to pay per QALY. In Australia, typically an implicit \$50,000 per QALY gained is assumed (16). An empirical estimation of \$28,033 per QALY gained could also be used (17).
- Distribute the estimate of population HOC across the equity-relevant strata using published estimates of HOC (these are not available for Australia but are for the UK by geographic area deprivation and can be further explored in sensitivity analysis (18)).
- Estimate population incremental net health benefit (NHB) per equity strata by subtracting the HOC from the estimated incremental benefits.

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- Estimate population QALY by multiplying quality-adjusted life expectancy (QALE) by population number (there is no QALE distribution estimates in Australia, but proportions from other countries can be applied, subject to sensitivity analyses (19)).
- Add population incremental NHB to total population QALY per equity-relevant strata. Results can be evaluated from an equity perspective by comparing the differences in total QALYs between the best and worse-off groups. A regression of NHB across all strata can also be fitted to account for intermediate groups yielding a slope index of inequality.
- Visualise the DCEA findings in the equity-efficiency impact plane (Figure 1) (20).

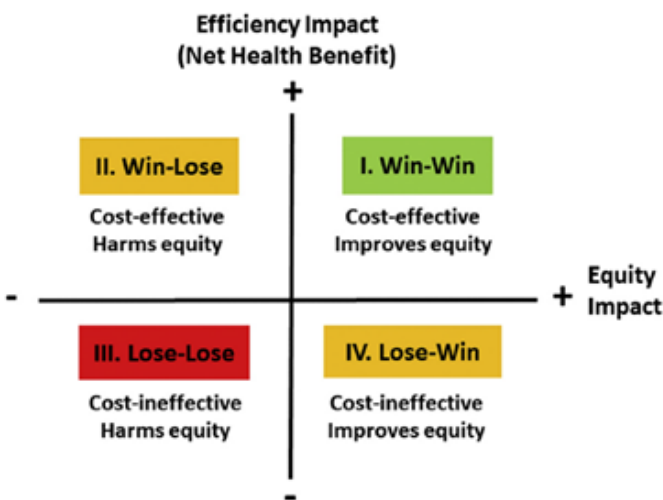
equity, or is cost-ineffective but improves equity. This trade-off analysis can be done by deliberation, but can also be informed formally by DCEA (14). Explicit analysis can be done, for example by using stakeholders' preferences for inequality aversion to weigh the results and determine if the impact of this equity-efficiency trade-off improves overall social welfare (21).

DCEA in practice

Although an emerging methodology, DCEA has been explored in cancer research. An analysis in England applied a simplified form of DCEA (also called aggregate DCEA (22))² to the use of alectinib and atezolizumab for non-small cell lung cancer as recommended by NICE (23). Equity-relevant inputs were sourced from the literature (QALE and HOC distribution, and inequality aversion), with other inputs sourced from public databases (age-standardised lung cancer incidence rates, and stage 3 or 4 diagnosis). The study found that alectinib improved both equity and efficiency. On the other hand, atezolizumab decreased efficiency and improved equity, but overall it did not improve social welfare. The results were mainly driven by the willingness to pay per QALY gained, patient population (size and distribution by deprivation), and level of societal inequality aversion.

Although DCEA has been discussed by decision-making bodies in the UK or Australia, it has yet to be formally implemented (13, 24). The HTA Review economic evaluation methods paper in Australia noted that DCEA could improve transparency in the decision-making process with respect to inclusion of equity considerations (24). However, it also noted specific challenges for the implementation of DCEA, such as defining equity concerns, as well as data collection and reporting (24).

Figure 1: Equity-efficiency impact plane



Source: Cookson R, Griffin S, Norheim OF, Culyer AJ, Chalkidou K. Distributional Cost-Effectiveness Analysis Comes of Age. *Value Health*. 2021 Jan;24(1):118-120.

Using the plane, the vertical axis tells us whether an intervention is better than the comparator in terms of efficiency and the horizontal axis tells us whether it is better with respect to equity. If an intervention falls within quadrants I or III, the decision of whether to adopt or reject an intervention is clear as it either reduces or increases both efficiency and equity. However, for quadrants II and IV, judgement is required as there are trade-offs; the intervention either is cost-effective but worsens

² Uses aggregated data on disease prevalence and the cost and health benefits of interventions.

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DCEA is data hungry

A key challenge for conducting a DCEA is the greater data requirement compared to traditional CEA, as distributional breakdowns for health outcomes are required (i.e., information is required on health outcomes and inputs of interest according to the 'equity' groups of interest). Thus, to conduct a DCEA, data would be required per equity strata. This can be sourced from clinical trials or observational studies for variables such as clinical effectiveness, uptake, adherence, and prevalence and incidence of the disease of interest.

Meunier et al. (2023) outlined three data recommendations and challenges for conducting DCEA (25):

- Decision-makers should define relevant equity considerations. This will make reporting of source data and DCEA relevant to priority setting and consistent between studies.
- There is a need for public investment to collect, process, and report data stratified by equity considerations of interest to high-quality standards.
- Clinical trial populations should be representative of the general population. It is acknowledged that clinical trials are usually underpowered to detect health differences per equity considerations. Observational studies can also play a role in informing evaluations. This is not only useful to DCEA but also to inform broader policymaking.

If there is an interest in collecting equity-relevant data in randomised clinical trials, the Consolidated Standards of Reporting Trials (CONSORT) statement has published an equity extension that can improve reporting (26). The extension includes:

- **Introduction:** describing the rationale for focusing on equity and including an equity relevant objective.

- **Methods:** reporting trial design aspects to answer equity questions such as the eligibility criteria or setting, comparator, reporting outcomes, if sample size or randomisation accounted for equity, additional analysis, and report ethical clearance and informed consent.
- **Results:** Describe each group's characteristics, exclusions, losses, baseline characteristics, ancillary results, details of implementation (coverage, intensity), and harms (intervention-generated inequity) per equity-relevant strata.
- **Discussion:** Discuss limitations to assess effects on health equity and report applicability to equity-relevant populations.

Given that the Cancer Plan outlines that First Nations people are a priority population, capturing variables by distributional breakdown of First Nations status will be relevant for the Australian context (9). The Australian Institute of Health and Welfare also collects IRSD data to represent socioeconomic position, which might also be relevant to decision-makers. Other equity considerations can also be considered appropriate, as further research is required to determine which ones are relevant to the Australian context.

Conclusion

Health equity is an important issue for healthcare priority setting. While traditional CEA only provides information on interventions' value for money, DCEAs can assess the trade-off between efficiency and equity to inform decision-making. However, improvements in data collection for equity factors of interest, as well as greater diversity in clinical trial populations, are needed to ensure DCEAs can be more routinely implemented in practice.

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