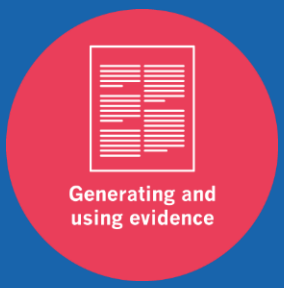
Estimation of cost-effectiveness thresholds reflecting resource constraints



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Conceptual clarity as to the underlying bases for cost-effectiveness thresholds is one thing; determining what cost-effectiveness thresholds are likely to reflect health opportunity costs in a wide range of jurisdictions facing diverse economic, political, health system and epidemiological conditions is quite another. Until very recently, few empirically estimated supply-side cost-effectiveness thresholds existed. A notable exception was a study by a study by Claxton et al (2015) that estimated a cost-effectiveness threshold for the United Kingdom (UK) National Health Service (NHS).

Centre for Health Economics researchers have now estimated supply-side cost-effectiveness thresholds for a much wider range of countries, including LMICs. Woods et al. (2015) estimate thresholds based upon the empirical estimate of the UK NHS threshold using the Claxton et al study and international income elasticities of the value of health. Ochalek et al. (2015) estimate thresholds using published econometric models analysing the effect of health expenditure on health outcomes from cross-country data as an input into a model that generates cost per DALY estimates. Estimates from both studies suggest that thresholds representing health opportunity costs are far below the range previously posited by the WHO. Nakamura et al (2016) assess the impact of health care expenditures on mortality using cross-country panel data and find the estimates are unstable and sensitive to changes in the data.

The estimates provided to date represent a first step to understanding health opportunity costs when resources are committed to healthcare interventions. The research suggests improvements in the quality of data available and further advances in methodological design would be valuable. Ultimately, understanding of this topic would benefit hugely from additional ‘within’ country estimates, similar to the Claxton et al study for the NHS but for other countries, particularly LMICs.

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The estimates can be used as one input to determining likely health opportunity costs when resource allocation decisions made in a jurisdiction, but policymakers should also carefully consider the merits of other possible claims on their resources. It should be noted that health opportunity costs are likely to be just one (although, arguably, the central) factor in health policy deliberations and other elements of social value beyond health improvement alone (e.g. related to concerns for equity and non-health outcomes) may also be considered.

Relevant publications from CHE researchers:

Publication and Short description of findings
Country-level cost-effectiveness thresholds: Initial estimates and the need for further research This study uses the Claxton et al (2015) estimate for the UK and extrapolates this to other countries using information from the literature relating country income to willingness to pay for mortality risk reductions. The validity of this work hinges upon the validity of the UK estimate of a supply-side CET and the validity of previous work looking at the relationship between country income and the value of a statistical life. **CHE Research Paper 109**. Beth Woods, Paul Revill, Mark Sculpher and Karl Claxton. 2015
Cost per DALY averted thresholds for low- and middle-income countries: Evidence from cross country data This study take a advantage of recent developments in econometric methods to control for endogeneity in the estimation of the mortality effects of changes in expenditure when using use cross-country data. The authors show how cross-country econometric models can be used as an input for calculating country-specific CETs through analysis of other health outcomes, use of additional data and explicit modelling assumptions. The authors found that the upper estimate of the range for nearly every country falls below 3x GDP per capita and is below 1x GDP per capita for the vast majority of countries. **CHE Research Paper 122**. Jessica Ochalek, James Lomas and Karl Claxton. 2015
Methods for the estimation of the National Institute for Health and Care Excellence cost-effectiveness threshold This study provides an estimated cost-effectiveness threshold based upon thorough analysis of country programmatic spending data and resulting health outcomes. The authors estimated a causal link between changes in expenditure and mortality outcomes using data on different disease areas (programme budget categories). This is the only in-country study available that estimates a specific supply-side CET. **HTA Report**. Karl Claxton, Steve Martin, Marta Soares, Nigel Rice, Eldon Spackman, Sebastian Hinde, Nancy Devlin, Peter C Smith and Mark Sculpher. 2015

Assessing the impact of health care expenditures on mortality using cross-country panel data

This paper re-examines the literature on the impact of public health expenditure on mortality, using a global cross-section or panel of country-level data. The analysis builds on the two instrumental variables (IV) approaches embodied by key publications in the field – Bokhari et al. (2007) and Moreno-Serra and Smith (2015). It found that while it was possible to replicate the results, further analyses incorporating updated data and robustness checks, reveal highly sensitive results. The authors call for further methodological work in an effort to derive more robust estimates of the marginal productivity of public health care funding.

CHE Research Paper 128. Nakamura R, Lomas J, Claxton K, Bokhari F, Morena Serra R, Suhrcke M. *2016*

iDSI Workshop on Cost-Effectiveness Thresholds: Conceptualisation and Estimation – Summary report

On 26 June 2015, a group of 50 researchers and international policymakers interested in resource allocation and cost-effectiveness thresholds (CETs) came together in London to present different perspectives on the conceptualisation of thresholds; to present empirical research; to estimate thresholds; and to agree appropriate guidance on the use of thresholds. This report summarises the main outcomes of the meeting. Among a number of discussion findings, it was noted that the term ‘threshold’ can convey various meanings for different types of metrics and purposes. It was proposed that in future, a more descriptive terminology could help to improve understanding and dissemination of ‘cost-effectiveness threshold’ research.

Centre for Health Economics, University of York. 2015