Can we be more consistent?

The issues of cost-effectiveness threshold

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21 September 2018

Some slides are from the presentation of Prof. Mark Sculpher, University of York

In this seminar, we will learn….

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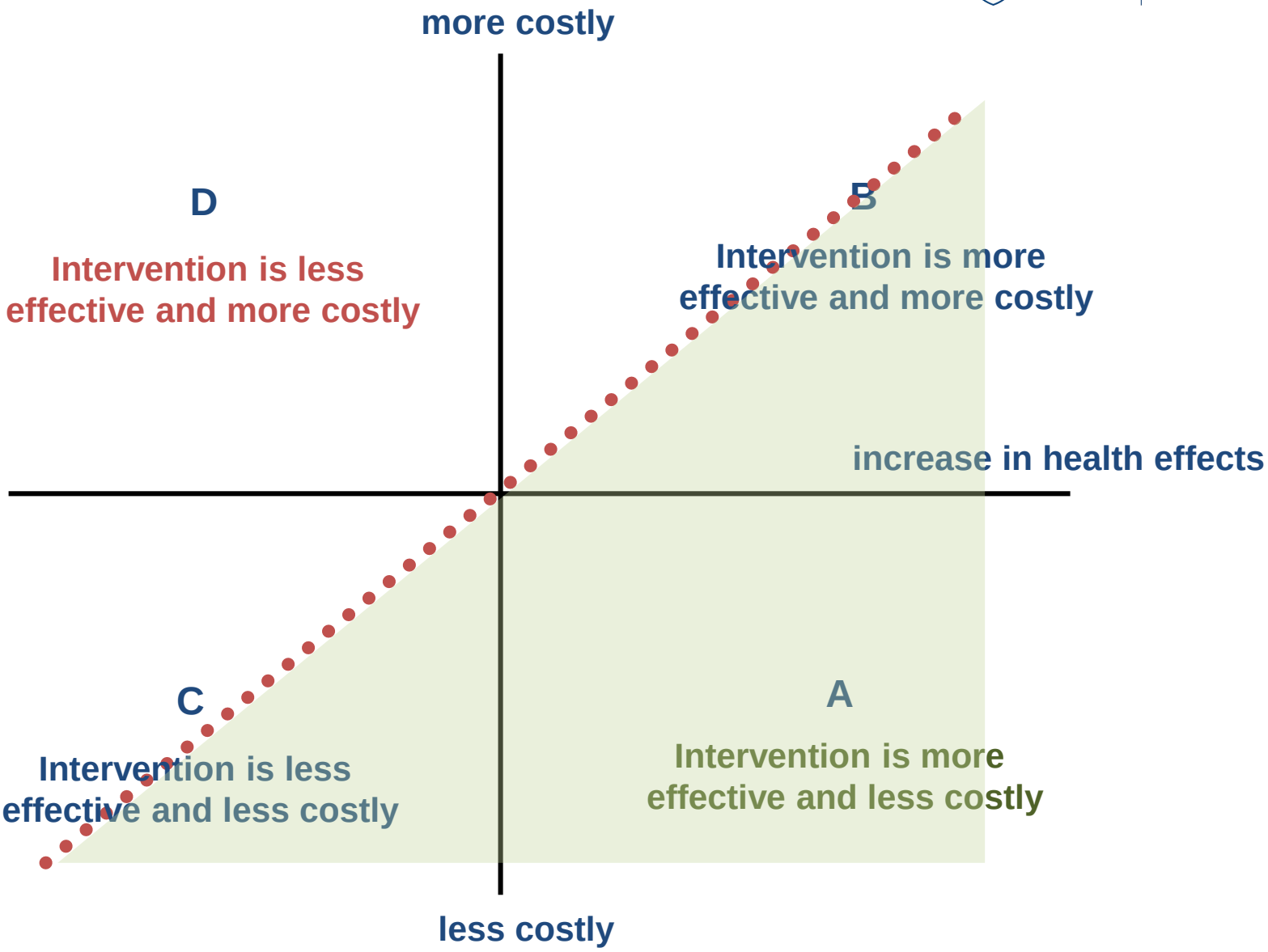
- What is the CE threshold?
- How to identify the CE threshold?
- The CE threshold in practice
- Challenges in using the CE threshold
- Questions to be asked when thinking about the CE threshold

"Without the CE threshold, policy-makers in LMICs found it difficult to interpret and use the CEA results"

Luz A, Santatiwongchai B, Pattanaphesaj J, Teerawattananon Y. Identifying priority technical and context-specific issues in improving the conduct, reporting and use of health economic evaluation in low- and middle-income countries. Health Res Policy Syst. 2018 Feb 5;16(1):4.

Cost-effectiveness plane

NUS National University of Singapore
Saw Swee Hock School of Public Health



Setting the CE thresholds

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1. Demand-side derived thresholds

"It is based on the value of what individuals, governments, or the society want from heath systems. Opportunity costs are therefore reflected in terms of foregone consumption or the consumption of value health"

- Using benchmark interventions e.g. $50,000 in US, £20,000-30,000 in UK
- Population-based WTP for a QALY

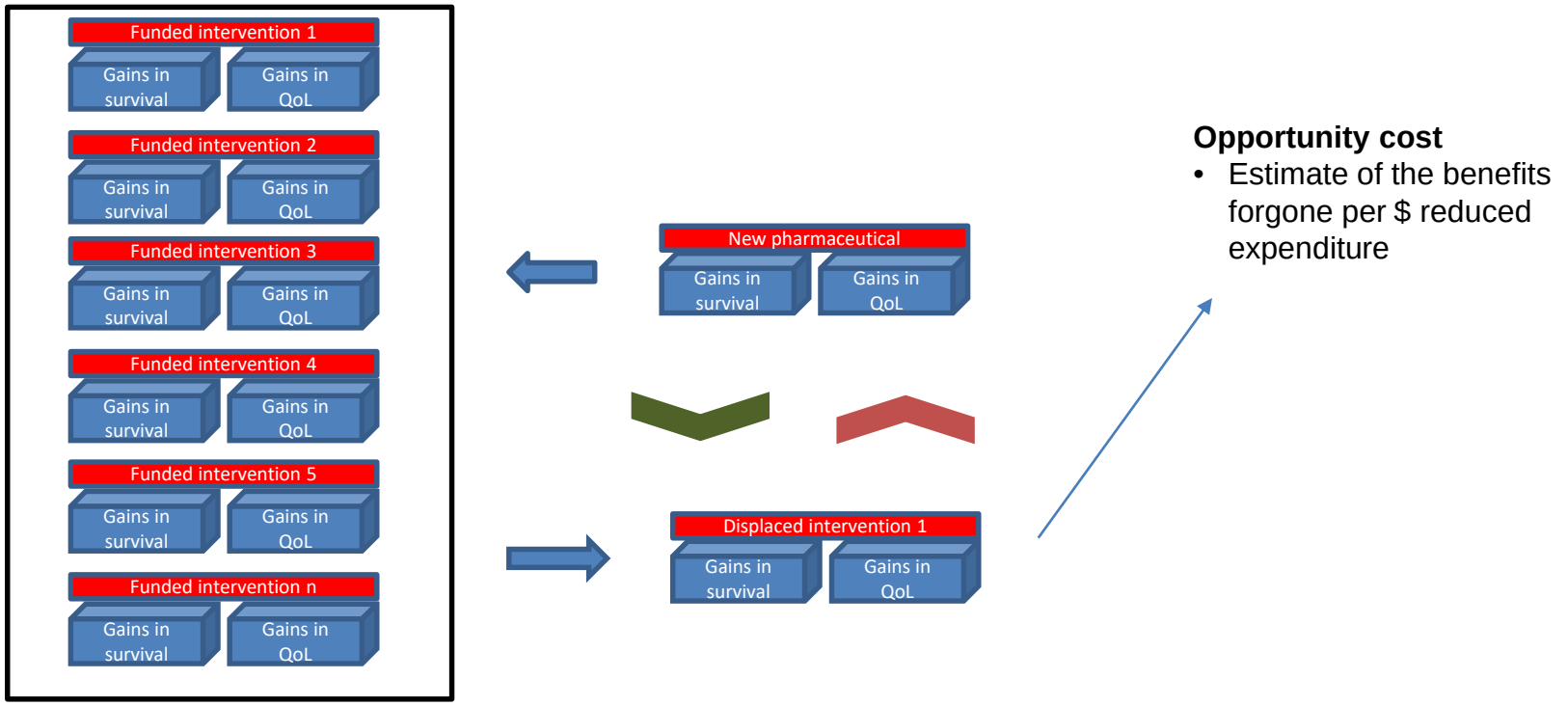
2. Supply-side derived thresholds

"It takes resource allocation into account through estimating health foregone when a provider chooses to allocate its available budget on a new intervention, consequently reducing allocation on older interventions"

- Opportunity cost

Supply-side threshold (with limited resources)

Health system funding

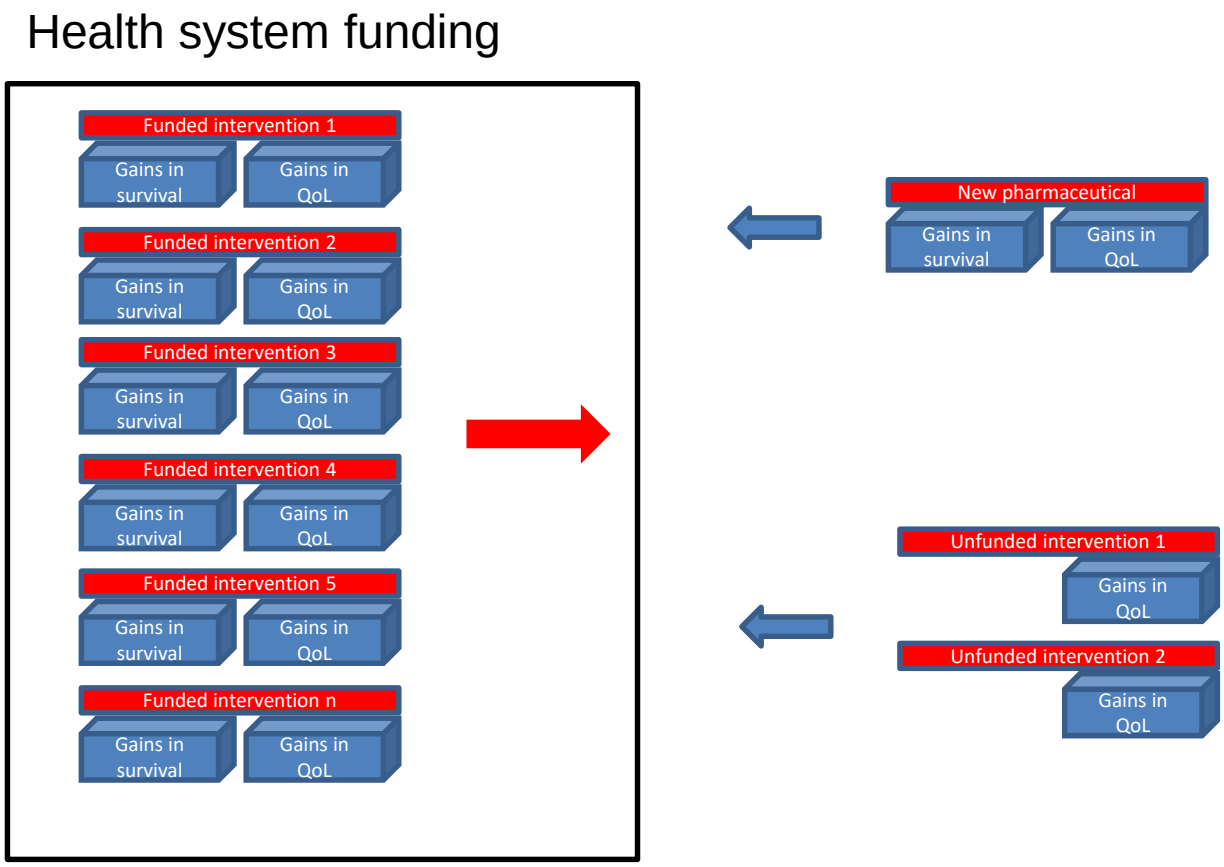


Opportunity cost

- Estimate of the benefits forgone per $ reduced expenditure

Modified from Sculpher (2018) What Evidence Should be Used to Quantify Cost-Effectiveness Thresholds for Decision Making in the Asia-Pacific Region?

Supply-side threshold (with increased resources)

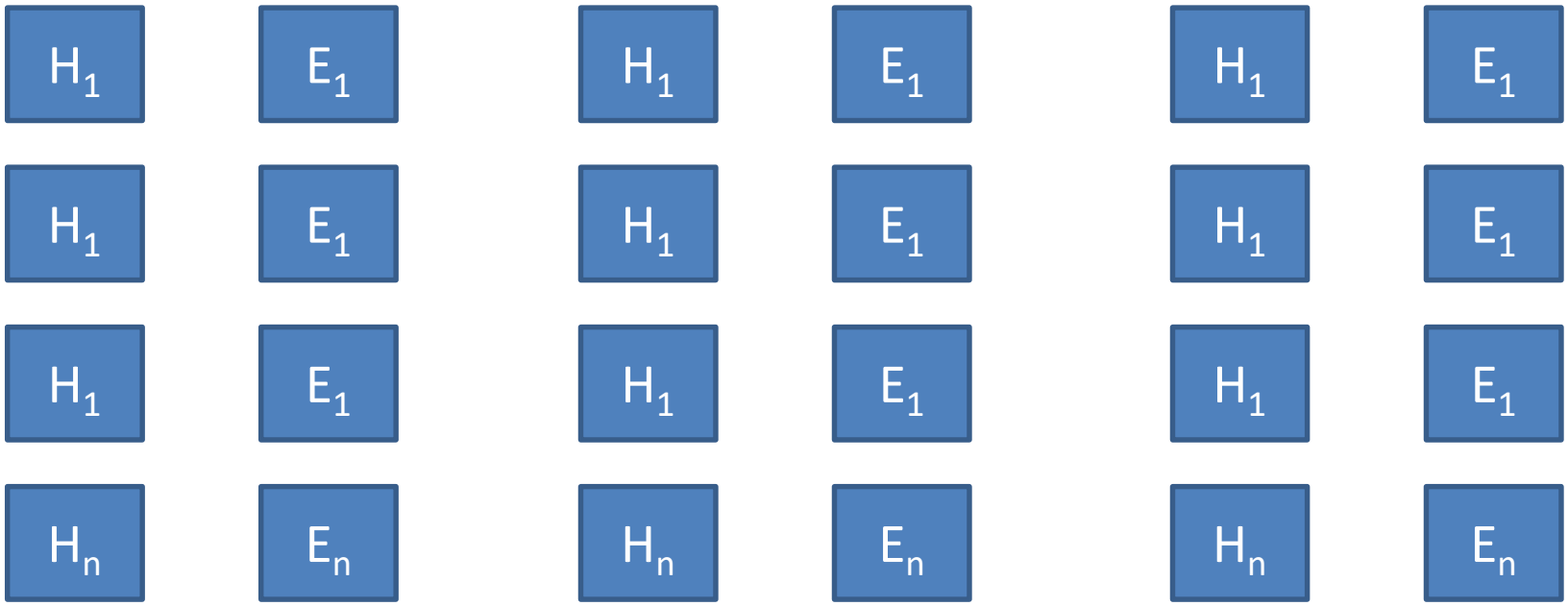


Opportunity cost

- Estimate of the benefits forgone per $1m increased expenditure

Sculpher 2018 What Evidence Should be Used to Quantify Cost-Effectiveness Thresholds for Decision Making in the Asia-Pacific Region?

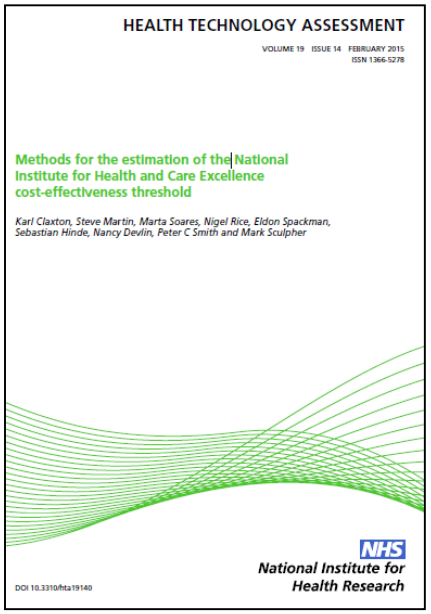
Estimation



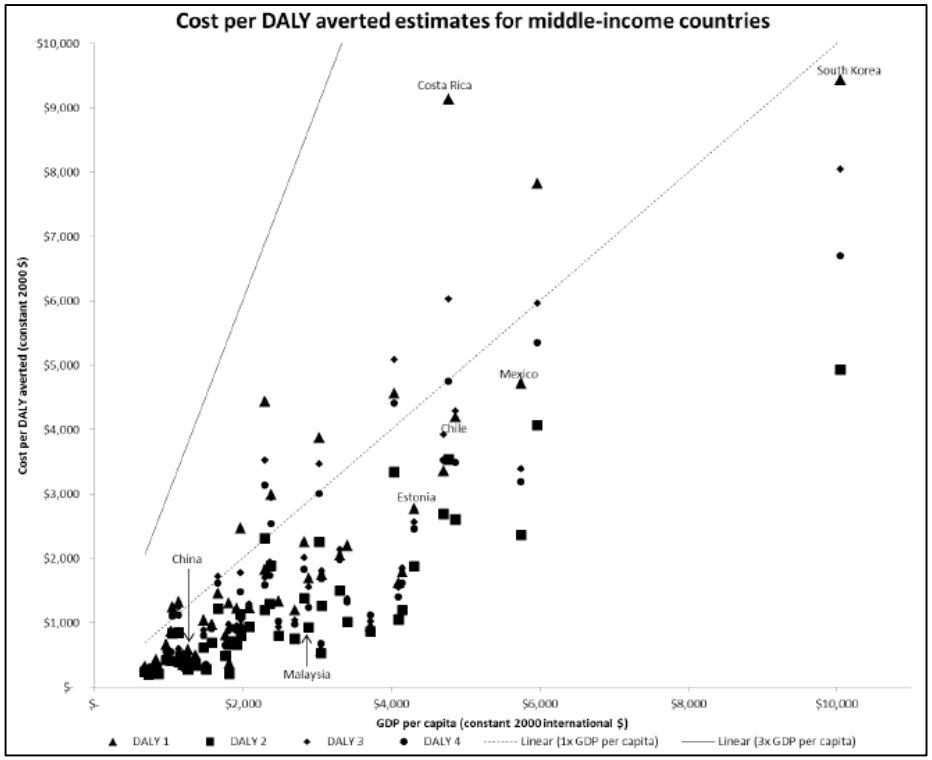
% change in health given a percentage change in expenditure

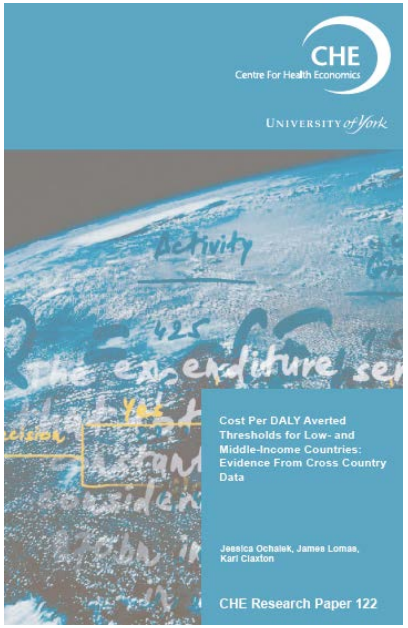
Sculpher 2018 What Evidence Should be Used to Quantify Cost-Effectiveness Thresholds for Decision Making in the Asia-Pacific Region?

Empirical basis for health opportunity costs



- Estimate of marginal productivity of English NHS
- Based on linking expenditure to mortality
- Central estimate £12,936 per QALY





Claxton *et al. Health Technol Assessment,* 2015. 19(14).

Oshalek et al. CHE Research Report 122, 2015

Only UK and Thailand have determined the CE threshold explicitly (Schwarzer et al. 2015)

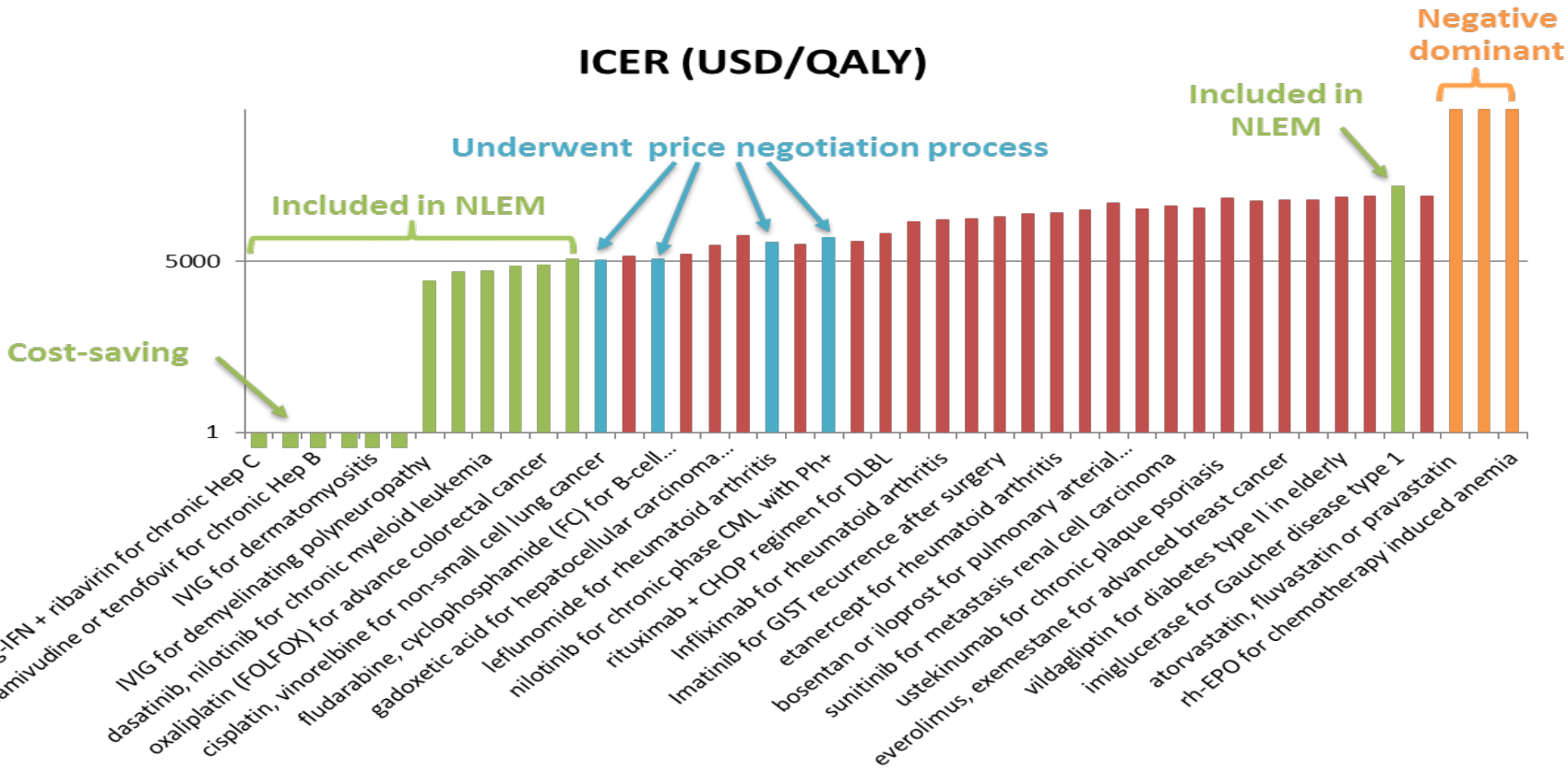
WB income level	Thresholds									
	Country/agency	G + U	CM	PM	PCM	3 × GDPPC	T-upper	1 × GDPPC	T-lower	T-unit
Explicit										
High	UK  NICE	X X[†]	EoL, cancer drugs fund, PAS	–	–	105,000	60,000	35,000	40,000	QALY
Upper middle	TH  HITAP	X	–	–	–	12,000	4000	4000	4000	QALY
Implicit										
High	US 	X	EoL care and outcomes	–	–	135,000	111,000	45,000	111,000	QALY
High	AU 	X	Specific rules[‡]	Integrated pathway, assessment guidelines[§]	–	135,000	34,500	45,000	34,500	QALY
High	SE 	X	–	–	–	129,000	117,000	43,000	12,000	QALY
High	CA 	X	Cancer treatment[¶]	–	–	120,000	44,000	40,000	44,000	QALY

CE thresholds in Thailand
in Baht per QALY/DALY

Year	2008-2010	2010-2012	2013-present

The Thailand's CE thresholds were determined by decision makers (NLEM subcom) without refereeing to per capita GDP or GNI

The CE threshold in practice (the inclusion of medicines in the NLEM)



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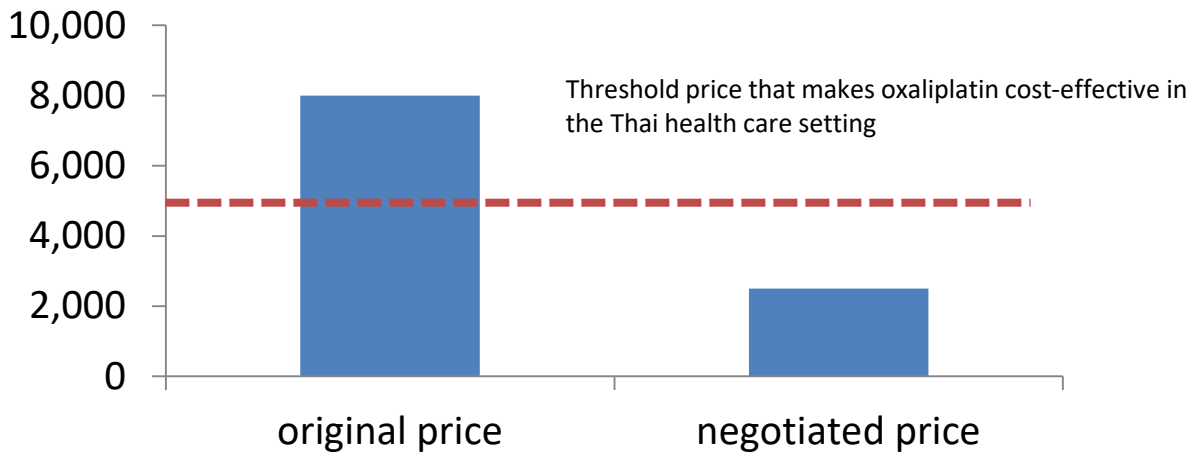
Threshold analysis for price of oxaliplatin



Budget saving from HTA-informed policy decisions in Thailand

Medicine	Indications	Original price (THB)	Reduced price (THB)	Potential saving (THB per year)
Tenofovir	HIV	43	12	375 million
Pegylate interferon alpha-2a (180 mcg)	Hepatitis C	9,241	3,150	600 million
Oxaliplatin (injection 50 mg/25 ml)	Colon cancer	8,000	2,500	152 million
Angiogenesis inhibitor	Macular disease	40,000 (Ranibizumab)	1,000 (Bevacizumab)	1,200 million

Teerawattananon Y and Tritasavit N. A learning experience from price negotiations for vaccines. Vaccine. 2015 May 7;33 Suppl 1:A11-2.
Teerawattananon Y, Tritasavit N, Suchonwanich N, Kingkaew P. The use of economic evaluation for guiding the pharmaceutical reimbursement list in Thailand. Z Evid Fortbild Qual Gesundhwes. 2014;108(7):397-404

The challenges in using the CE threshold

- The CE threshold is unrelated to budgets; thus, it fails to address affordability e.g. hepatitis C screening and treatment etc.
- Stakeholders will never be happy with the identified threshold
  - Healthcare payers want the threshold to be as low as possible
  - Industry want them to be as high as possible
  - Academics want the threshold to be evidence-based
  - The public want the threshold to be more understandable

The QALY maximization concept may not always be perceived as the most preferable option when making coverage decisions; thus, the CE threshold should not be used in a rigid manner

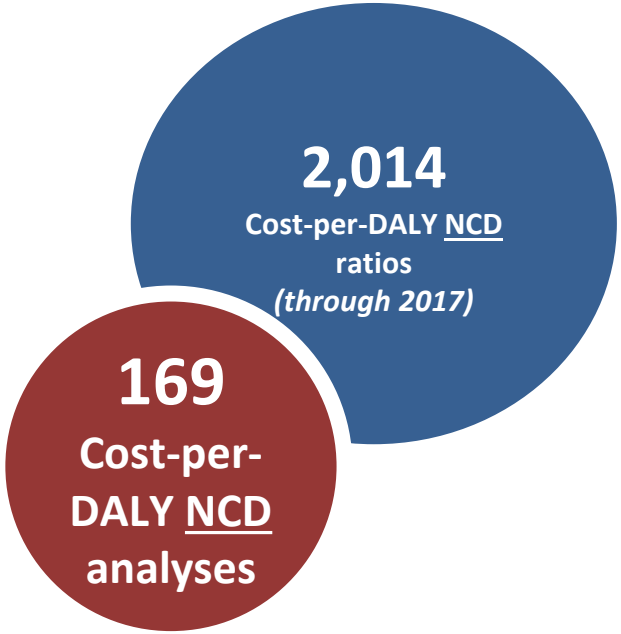
Determining the CE threshold is not a context-free requirement

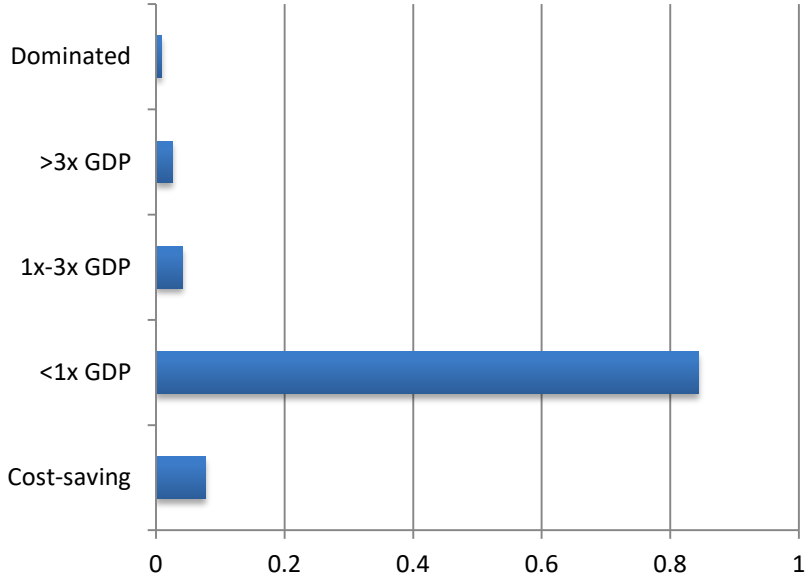
- the CE threshold is not used in isolation but in context specific process for decision making supported by other issues e.g. legislation, stakeholder buy-in etc.
- For example, should the country CE threshold being used by global health donors?

WHO is no longer recommending the CE threshold based on the country's per-capita GDP (Bertram et al 2016)

- *In 2001, the World Health Organization's Commission on Macroeconomics in Health suggested cost–effectiveness thresholds based on multiples of a country's per-capita GDP…..However, experience with the use of such GDP-based thresholds in decision-making processes at country level shows them to lack country specificity and this – in addition to uncertainty in the modelled cost–effectiveness ratios – can lead to the wrong decision on how to spend health-care resources.*

NCDs-related cost-per-DALY studies from the GH CEA Registry (Neumann et al 2018)





Questions to be asked when thinking about the CE threshold

- Why the CE threshold is needed given the decision making context?
- Have legitimate stakeholders been involved in the determination of the CE threshold and its implementation?
- What kinds of impact, economic or others, are not considered when using the CE threshold and why? Can we improve the analysis and/or decision making process?
- Is the use of the CE threshold help decision makers gaining desirable outcome in making coverage decisions?
- When and how to update the CE threshold?

Cost effectiveness thresholds

Asked: 23 Feb 2018 | 162 views | REPORT ABUSE

How can a country ensure that the cost effectiveness thresholds that they will set are appropriate?

Costing Health policy

EXPERT REPLIES:

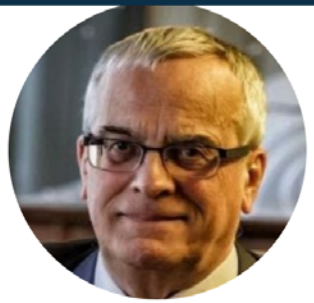
Anthony Culyer

Emeritus Professor of Economics | United Kingdom | Replied: 06 Mar 2018 at 19:57

Hi! There is no certainty here, so to "ensure" is too strong. A good test, if you are a person of good judgment, would be to ask of the current threshold - if we take decisions based on this is it likely that the result will overwhelm the healthcare budget? If so, then the threshold is too high. Lower it!

In the unlikely event that you estimate the opposite impact on the budget, Raise it!

Best to play this conceptual game at a table with locally knowledgable colleagues.



Anthony Culyer

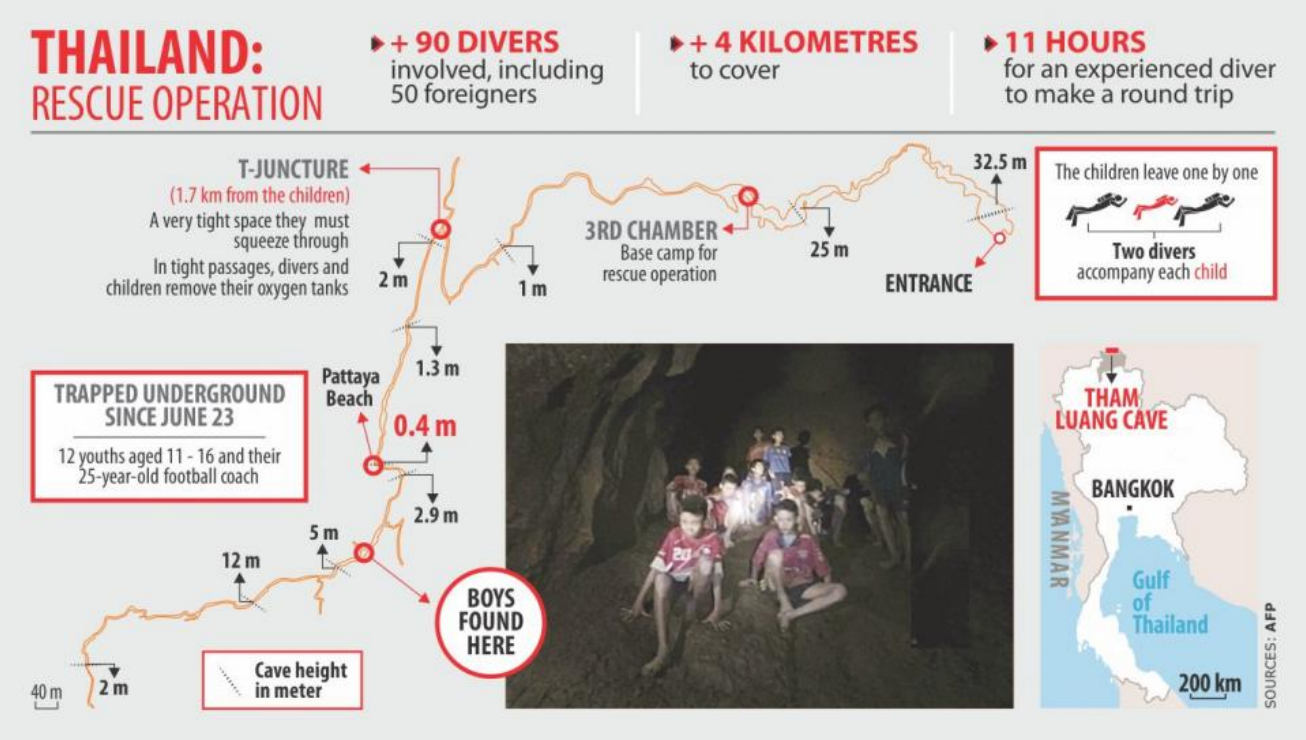
Emeritus Professor of Economics

Emeritus Professor of Economics, Centre for Health Economics, University of York

Health policy

HAVE A QUESTION?

The next seminar: Ethical issues in health resource allocation



Health Technology Assessment: selecting the highest value care

Training and symposium

8-10 Jan 2019 National University of Singapore

Who will you learn with?

Teaching Faculty for the course will be from the Saw Swee Hock School of Public Health (SSHSPH) and the Health Intervention and Technology Assessment Program (HITAP), Thailand, and include:

- Dr. Yot Teerawattananon
- Assoc. Prof. Luo Nan
- Asst. Prof. Wee Hwee Lin
- Assoc. Prof. Joanne Yoong
- Waranya Rattanavipapong
- Dr. Ritika Kapoor

Key persons from HTA agencies in India, Indonesia, Singapore and Thailand will also join in as guest speakers:

- **Prof. Sudigdo Sastroasmoro** *Chair of the HTA Committee, Indonesia*
- **Prof. Kriang Tungsanga** *The Chair of National List of Essential Medicine Subcommittee, Thailand*
- **Dr. Kelvin Bryan Tan** *Director, Policy Research and Evaluation Division, MOH, Singapore*
- **Prof. Mardiati Nadjib** *University of Indonesia, Indonesia*
- **Dr. Daphne Khoo** *Executive Director, Agency for Care Effectiveness, MOH, Singapore*
- **Prof. Shankar Prinja** *Post Graduate Institute of Medical Education and Research (PGIMER), India*
- **Prof. Budi Hidayat** *University of Indonesia, Indonesia*
- **Prof. Teo Yik Ying** *Dean, SSHSPH, NUS, Singapore*
- **Prof. Eric Finkelstein** *Duke-NUS Medical School, Singapore*

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Thailand

Dr. Daphne Khoo
Executive Director, ACE, MOH, Singapore

Dr. Yot Teerawattananon
HITAP, Thailand
and SSHSPH, NUS, Singapore

How is the course organised?

Training		Policy Symposium
Tuesday, 8 January	**Wednesday, 9 January**	**Thursday, 10 January**
• Introduction to HTA • Identifying topics for HTA • Selecting the right approach to address policy questions in HTA • HTA case studies across settings • Evidence synthesis • Costing intervention • Outcome measures • QALY estimation (group exercise)	• Summary and review of Day 1 • Health economic evaluation and its decision rule • Model-based health economic evaluation • Modelling exercise (follow UK English) • Budget impact analysis • Social and ethical considerations in HTA • HTA for public health interventions • HTA systems and policy in Asia	• Welcome and introduction to symposium • Introduction to HTA agencies in Asia • HTA processes and methods across settings: do more with less? • HTA and its stakeholders: perspectives from professionals, politicians, patients and industry • How to enhance the impact of HTA: changing the plan but never the goal

Registration and fees

	Early registration (on or before 30 Sep 2018)		Late registration (after 30 Sep 2018)	
	Training	Symposium	Training	Symposium
Public sector participants	S$1,000	S$600	S$1,200	S$800
Private sector participants	$1,700	$800	$2,000	$1,000
NUHS/NUS staff and students	S$500	Free	S$800	Free