The State of Global Health Cost-Effectiveness Analysis: Insights for Action

Tuesday, September 10th 2019

12:00 PM – 1:00 PM EDT

Always Thinking Ahead.™

Proudly wellforce

CEVR
Center for the Evaluation of Value and Risk in Health

Tufts Medical Center

Floating Hospital for Children at Tufts Medical Center

Today's presenters

Peter Neumann, ScD

Dan Ollendorf, PhD

Kalipso Chalkidou, MD, PhD

CEVR
Center for the Evaluation of Value and Risk in Health
Tufts Medical Center

Center for Global Development

Imperial College London

Why cost-effectiveness analysis?

REUTERS

HEALTH NEWS AUGUST 8, 2019 / 9:44 AM / A MONTH AGO

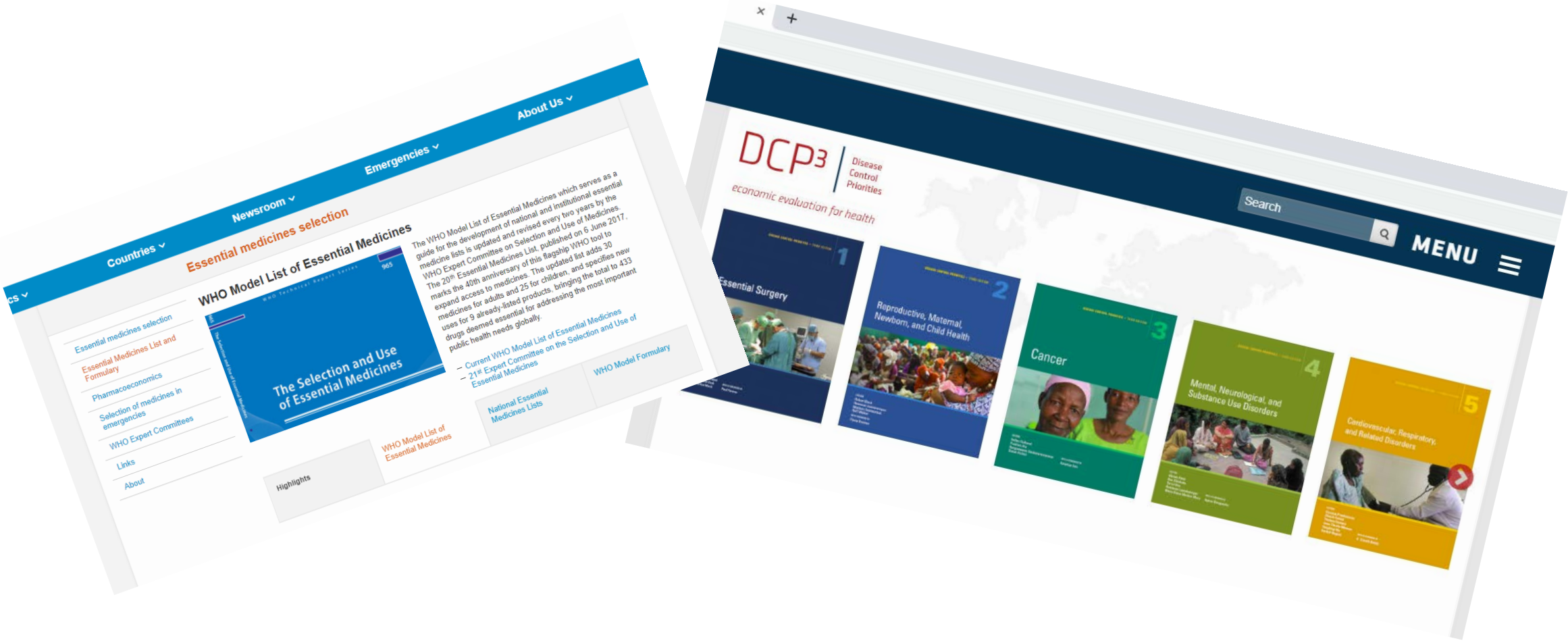
South Africa puts initial universal healthcare cost at $17 billion

Health Minister, Dr Zweli Mkhize

Agenda

1. Prioritizing resources for health
2. State of global health cost-effectiveness analysis
3. Using CEA
4. What makes a good study
5. Summary

Identifying global health “best buys”



Tufts Medical Center, CEVR

>8,000 Cost/QALY analyses

Tufts Medical Center

GLOBAL HEALTH | CEA REGISTRY

Funded by:

BILL & MELINDA GATES foundation

A standardized database of published cost-per-DALY averted studies

- Continually-updated
- Policymaker-friendly search tools
- Open access and available for download

ghcearegistry.org

Summary

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2. State of global health cost-effectiveness analysis
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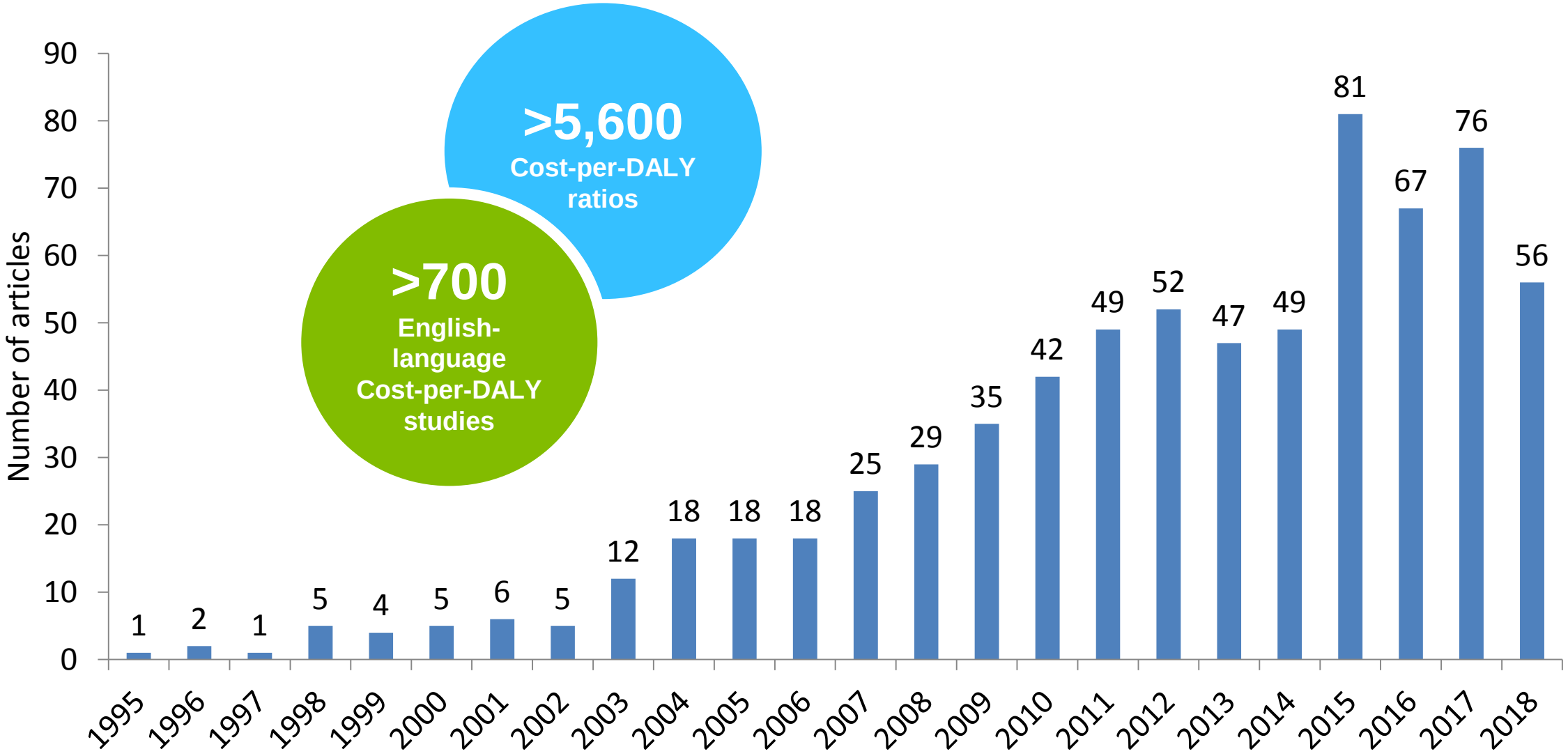
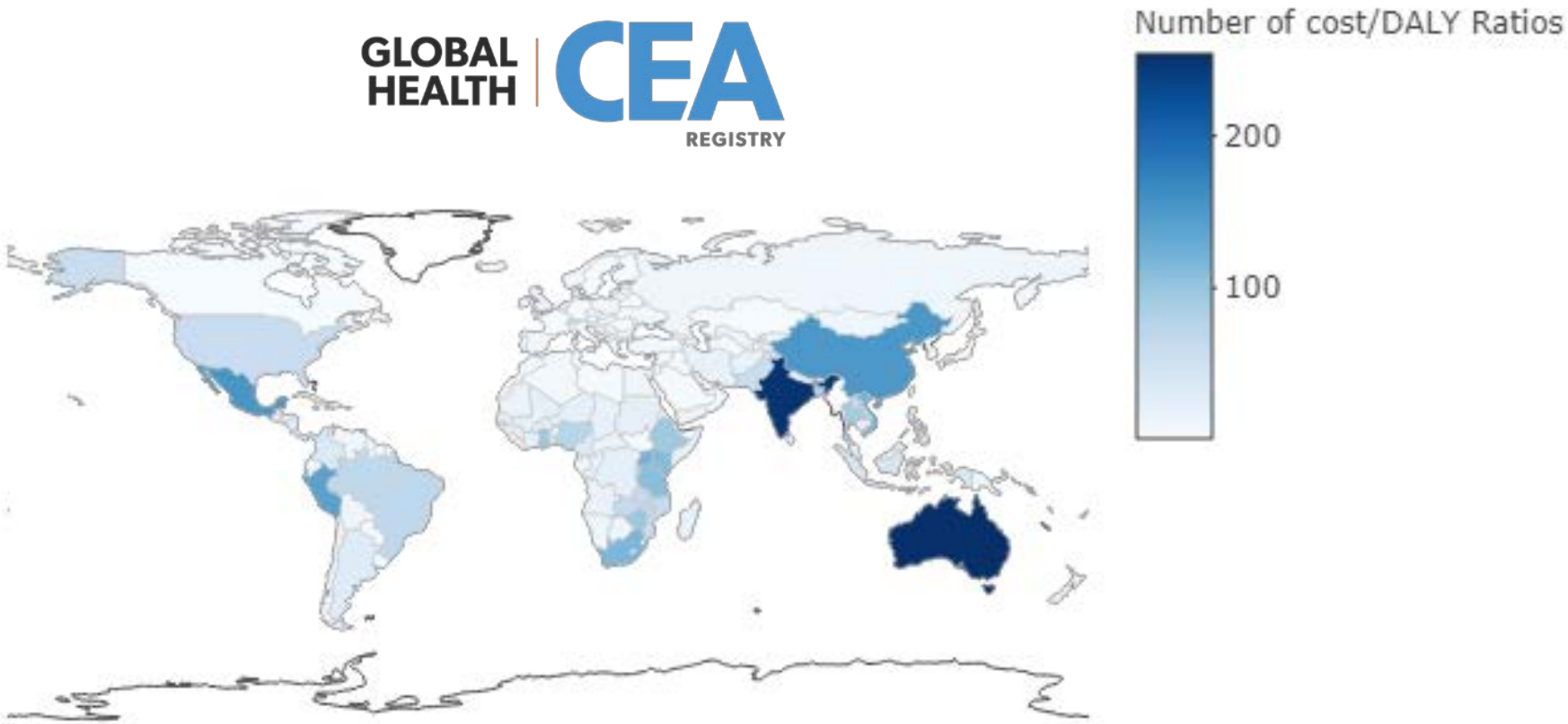
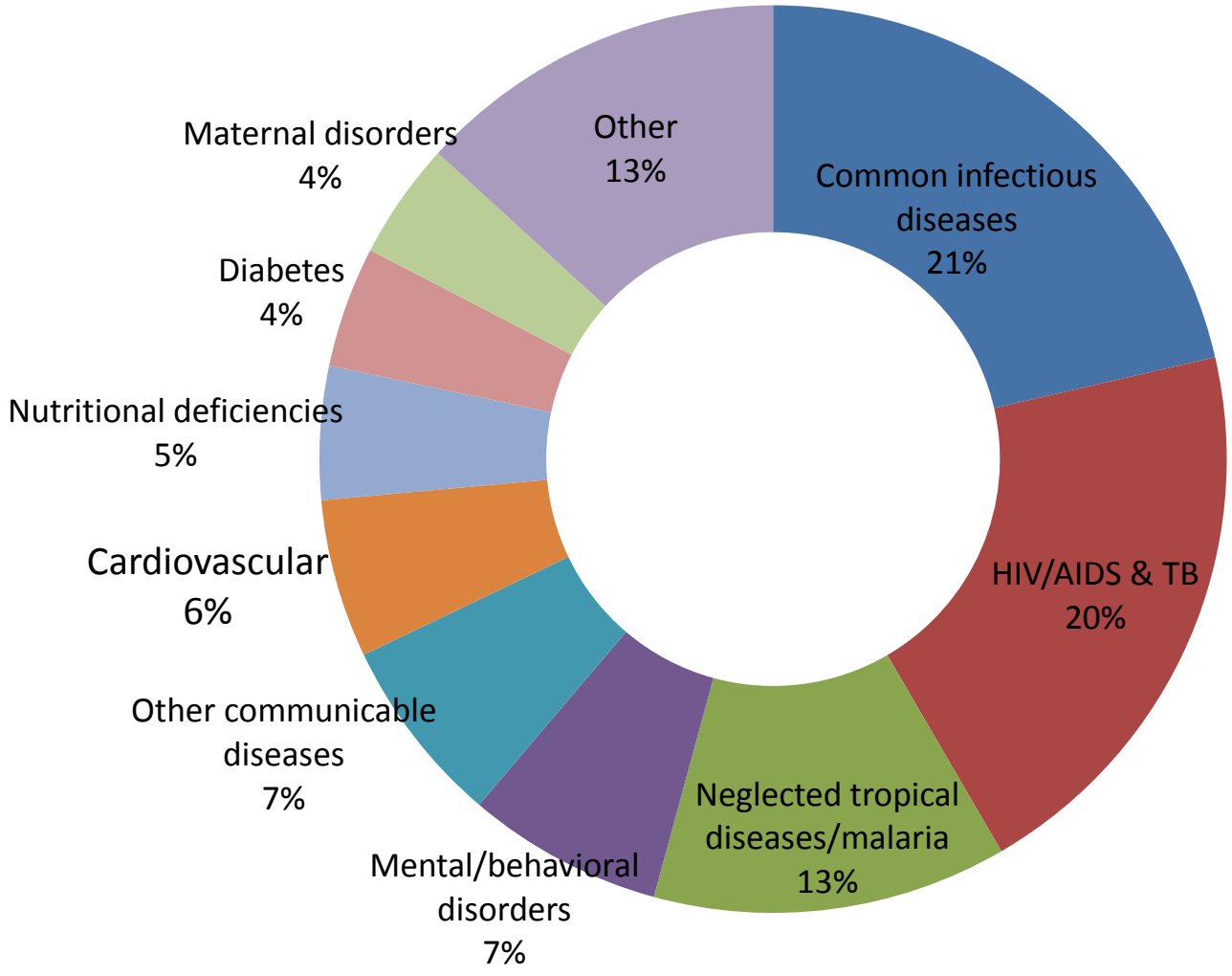
Cost-per-DALY studies



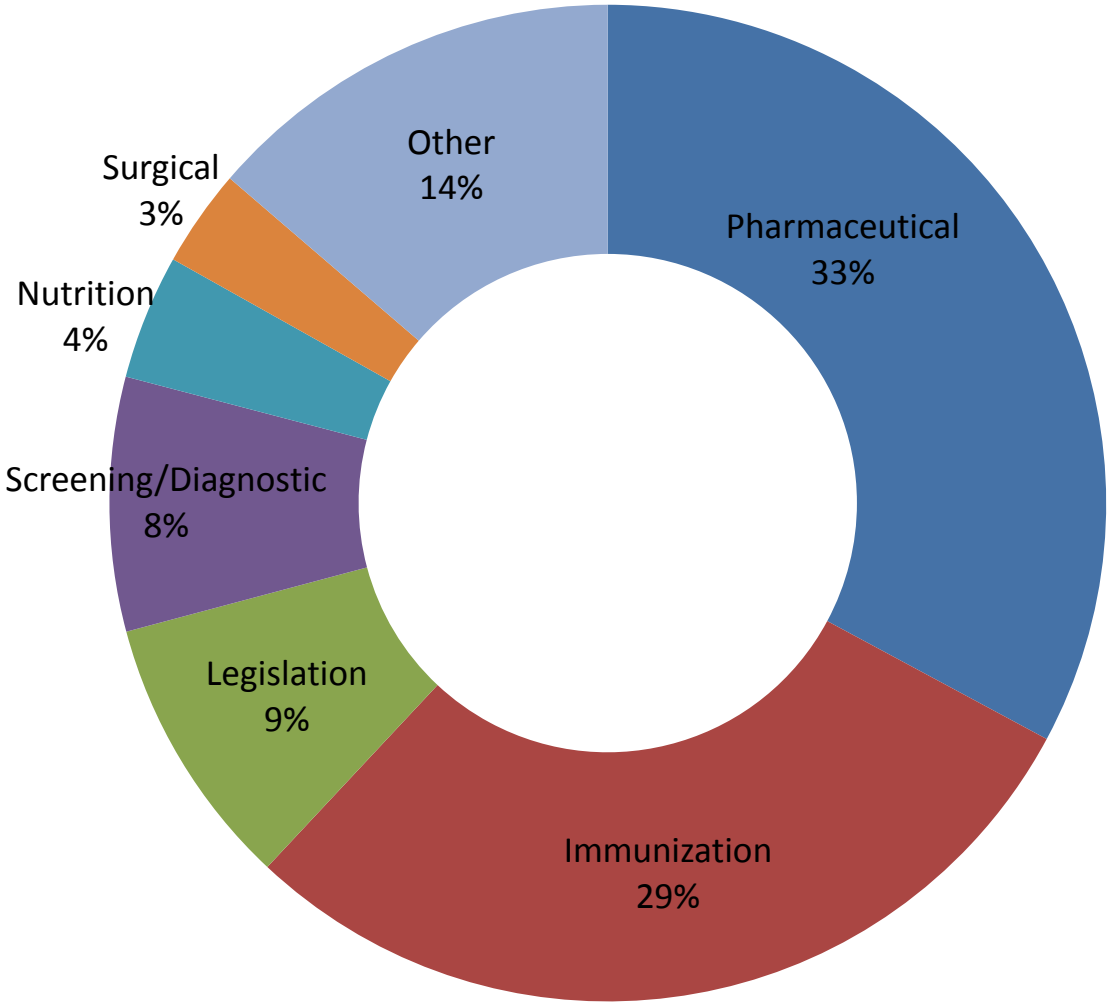
GLOBAL HEALTH | CEA REGISTRY



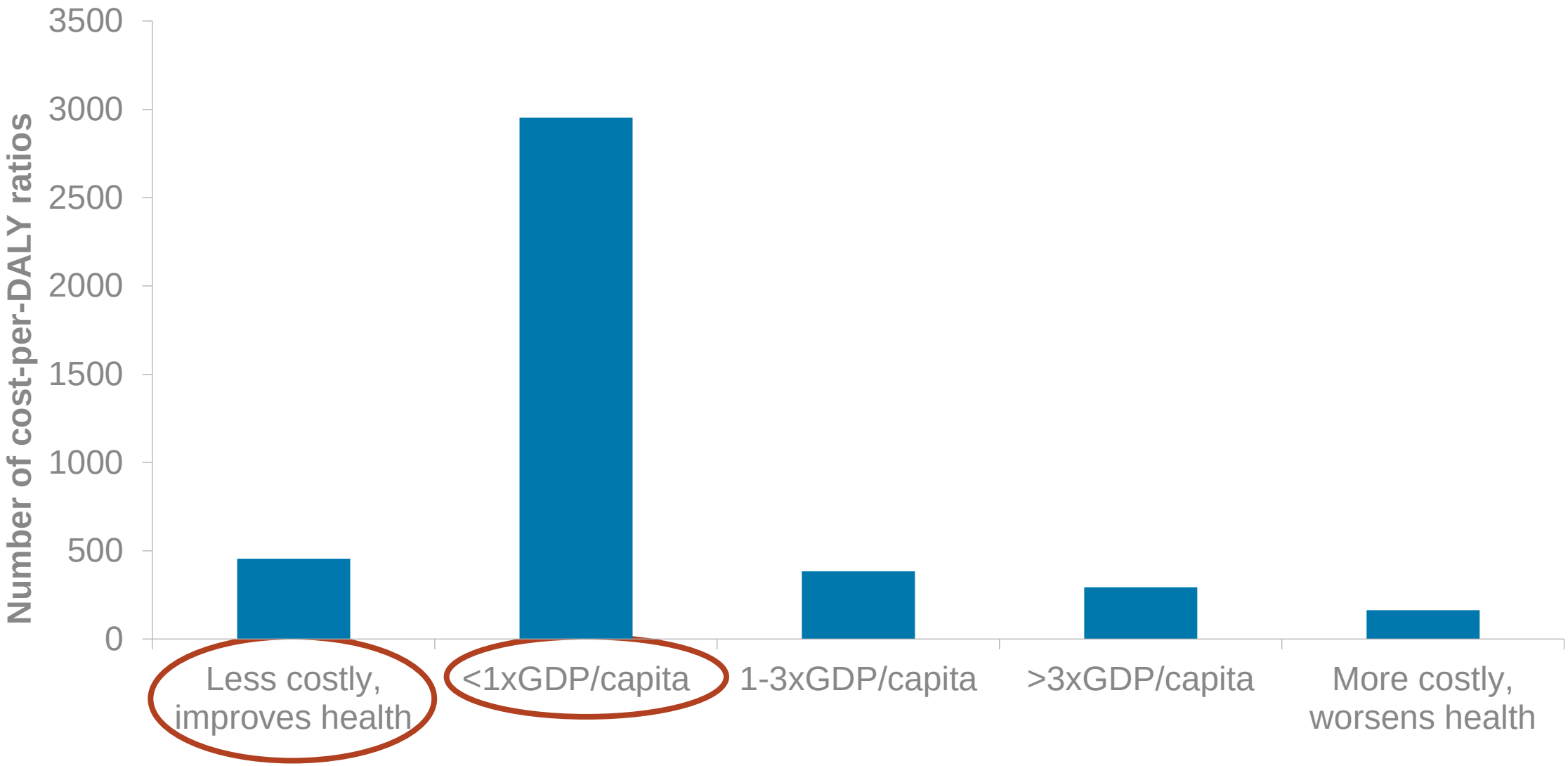
Cost-per-DALY studies by disease area (n=709)



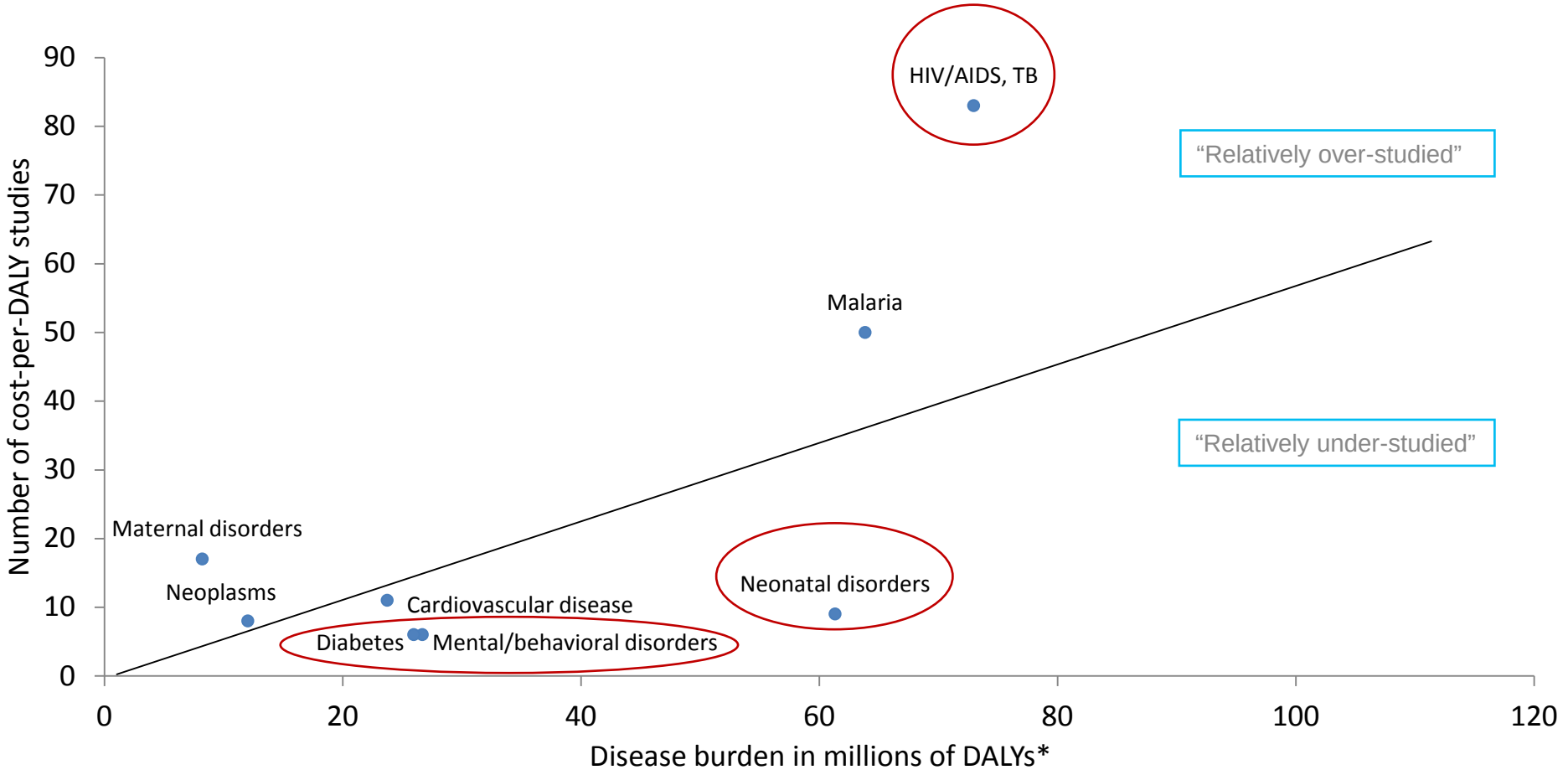
Intervention types (ratios, n=5,656)



Distribution of cost-per-DALY ratios

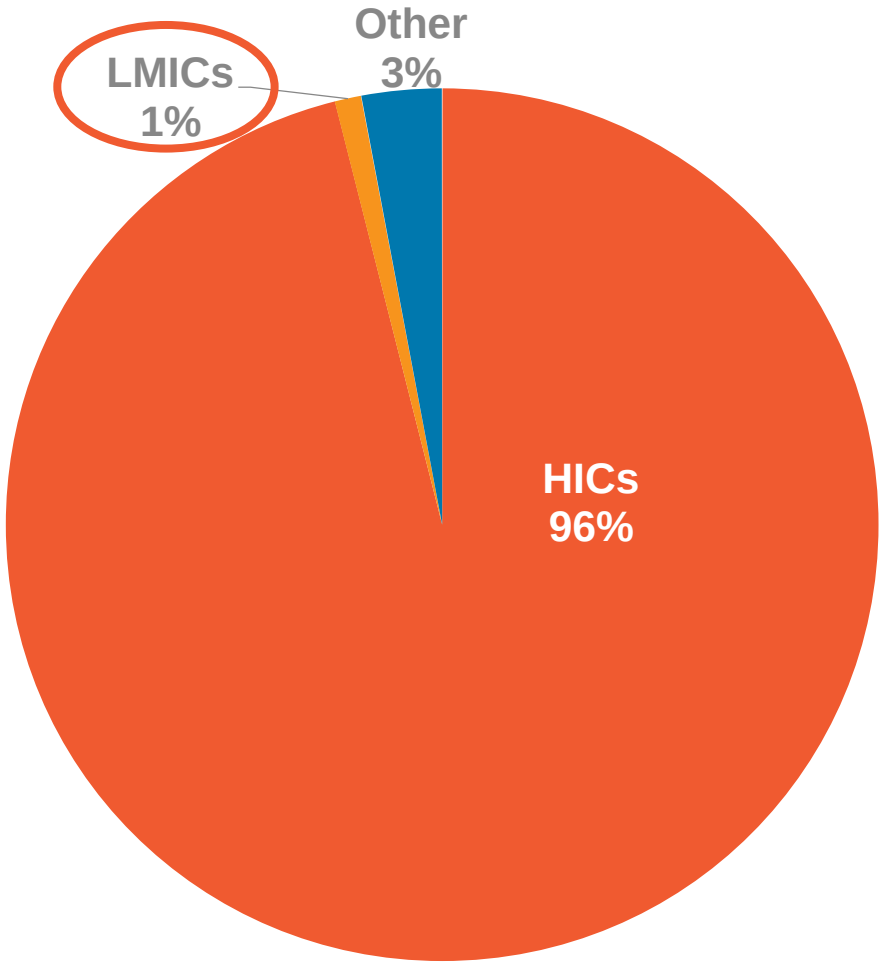


Over and under-studied literature: Sub-Sahara Africa

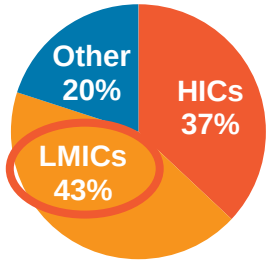


*Source: IHME

Cost-per-QALY studies (n=6,438)

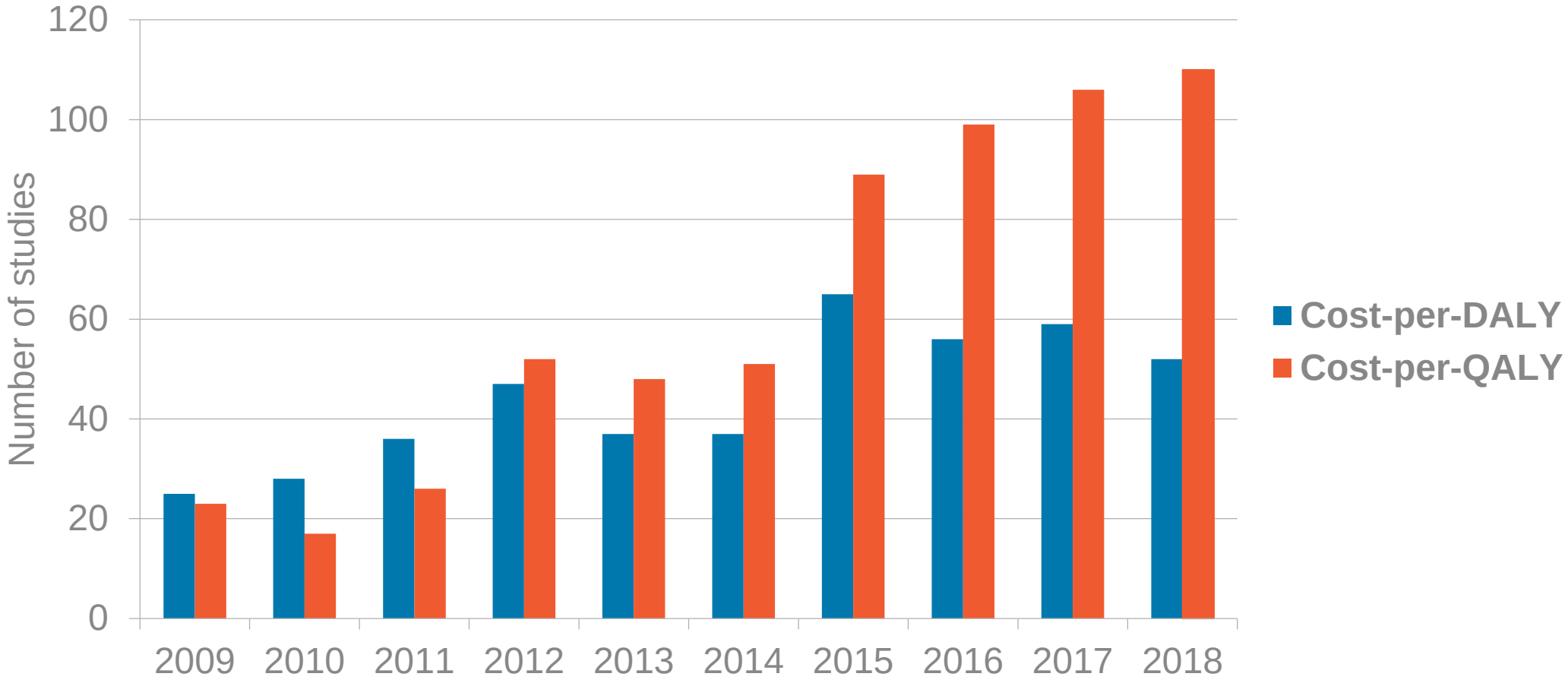


Cost-per-DALY studies (n=543)



Source: Neumann et al., *Gates Open Research* (2018). Data from 2016.

Growth of cost-per-DALY and cost-per-QALY studies in LMICs



Summary

- ☑ CEA literature in global health continues to grow
- ☑ CEA should keep pace with shifts in disease burden
- ☑ GH CEA Registry is a global public good

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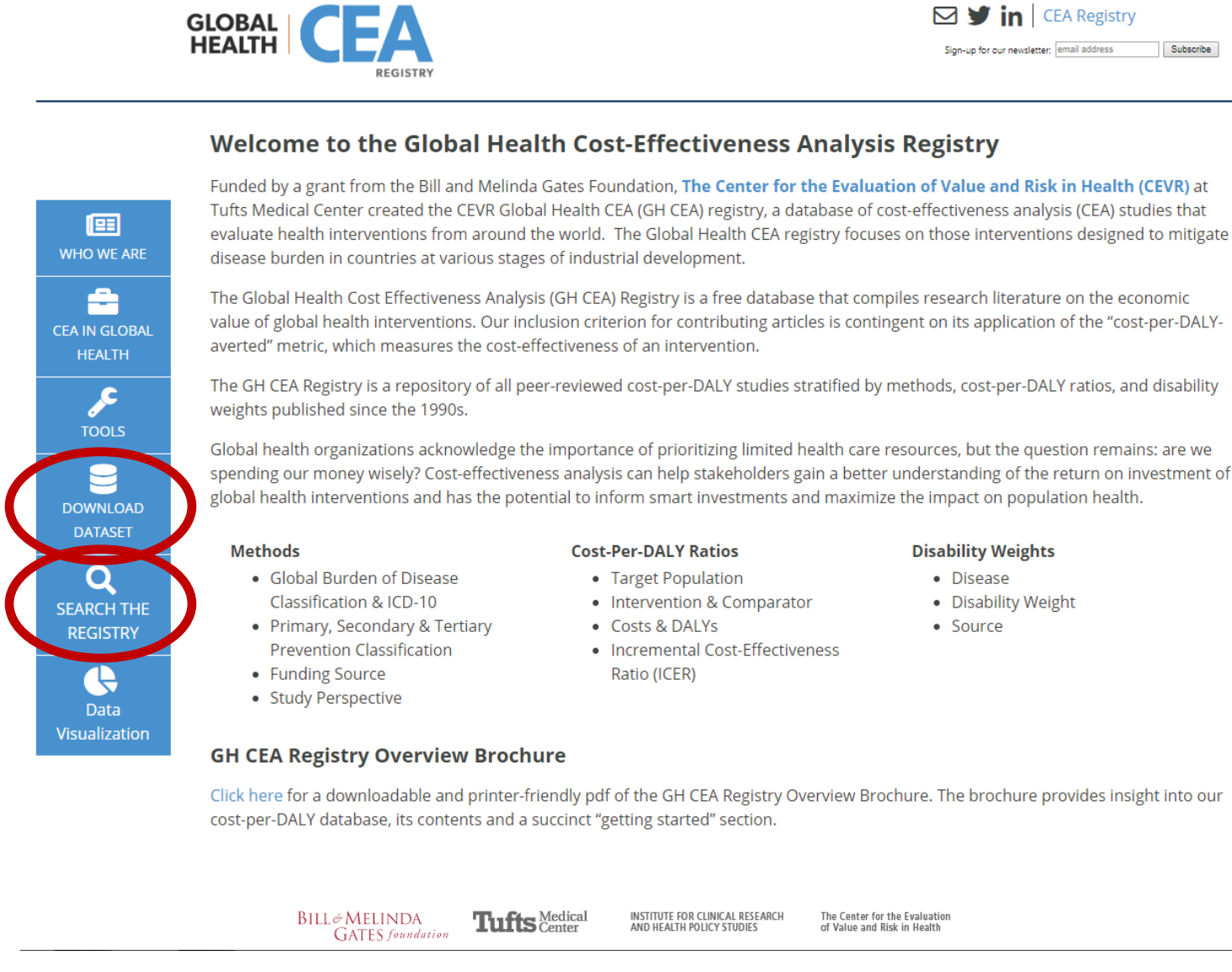
Example 1: Ranking interventions

- Scenario: Bangladesh Ministry of Health
- Need: Identify most cost-effective interventions for pregnant women
- Regionally appropriate

MoH logo: Bangladesh MoH website



ghcearegistry.org

Use the menus below to filter data. Multiple selections are permitted:

Keywords:

Select...

Disease:

Begin typing disease...

Intervention type:

Begin typing intervention type...

Comparator:

Begin typing comparator...

Country:

Begin typing country...

Region:

Begin typing region...

Publication year:

1995 — 2019

Reset filters

Advanced filters

Show 10 **entries**

GH CEA Registry League Table: Sorted by ICER from lowest to highest. Cost-Saving interventions (green) are considered lowest, Dominated interventions (red) highest.

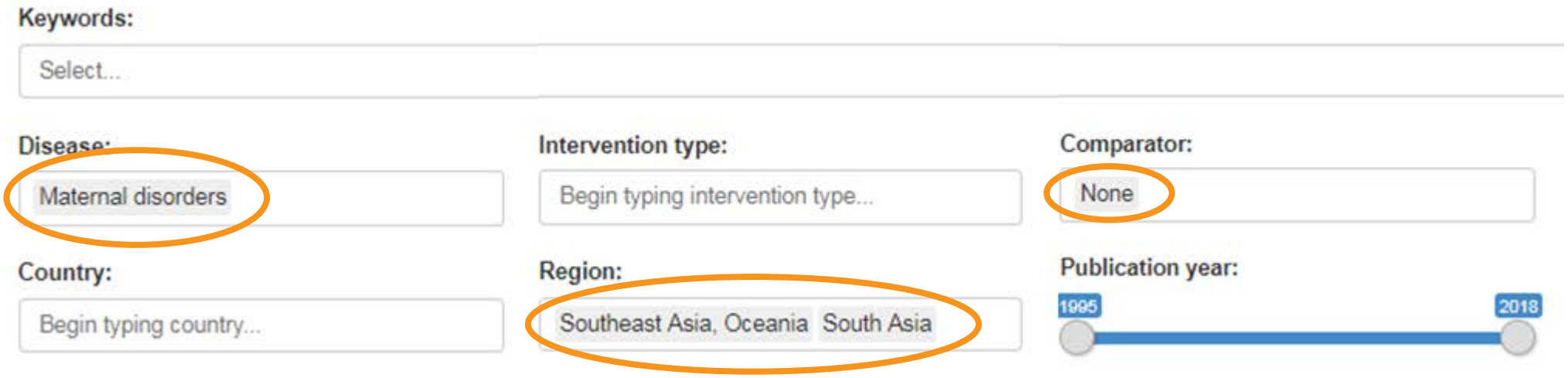
Article Title (Author)	Year	Sponsor	Disease	Country	Target Population	Intervention	Comparator	ICER ($/DALY averted)	ICER as % of GDP*	GDP Category (2018)^
Implications of scaling up cardiovascular disease treatment in South Africa: a microsimulation and cost-effectiveness analysis. (Basu)	2019	Academic	Ischemic heart disease, Hypertensive heart disease, Diabetes mellitus	South Africa	Both women and men ; Age: Adolescents: 12-18 years, Adults: 19-40 years, Adults: 41-64 years, Older adults: >65 years ; with Cardiovascular diseases and risk factors for CVD	Pharmaceutical: Scale-up of cardiovascular disease treatment based on WHO-PEN guidelines	Standard/Usual Care-Current treatment levels for chronic cardiovascular conditions	Cost-Saving	NA	Cost-Saving
Implications of scaling up cardiovascular disease treatment in South Africa: a microsimulation and cost-effectiveness analysis. (Basu)	2019	Academic	Ischemic heart disease, Hypertensive heart disease, Diabetes mellitus	South Africa	Both women and men ; Age: Adolescents: 12-18 years, Adults: 19-40 years, Adults: 41-64 years, Older adults: >65 years ; with Cardiovascular diseases and risk factors for CVD	Pharmaceutical: Scale-up of cardiovascular disease treatment based on South Africa's Primary Care 101 guidelines	Standard/Usual Care-Current levels of treatment for cardiovascular diseases	Cost-Saving	NA	Cost-Saving
Cost-effectiveness of dengue vaccination in ten endemic countries. (Zeng)	2018	Industry	Dengue	Brazil	Healthy ; Both women and men ; Age: Children: 6-11 years	Immunization: Routine dengue vaccination only at age 9	None	Cost-Saving	NA	Cost-Saving

Showing 1 to 10 of 5,257 entries

Download data!

Previous 1 2 3 4 5 ... 526 Next

Example filters:



Sample output:

Study	Intervention	Country	ICER ($/DALY averted)
Lohse et al.	Gestational diabetes prevention: screening; lifestyle adjustment	India	Cost-saving
Feldhaus et al.	Pre-eclampsia prevention, supplementations: calcium; magnesium sulfate	Nepal	$4
Sutherland et al.	Post-partum hemorrhage prevention: misoprostol treatment	India	$7
Adam et al.	Breast feeding support; tetanus vaccination	Bangladesh, Bhutan, India, North Korea, Maldives, Myanmar, Nepal, Timor Leste	$12

Example 2: Identifying available CEA

- Scenario:
  Prioritizing coverage for diabetes
- Need: Identify available CEA

MoH logo: Department of Health

CEA Registry

Sign-up for our newsletter: email address Subscribe

WHO WE ARE

CEA IN GLOBAL HEALTH

TOOLS

DOWNLOAD DATASET

SEARCH THE REGISTRY

Data Visualization

Welcome to the Global Health Cost-Effectiveness Analysis Registry

Funded by a grant from the Bill and Melinda Gates Foundation, **The Center for the Evaluation of Value and Risk in Health (CEVR)** at Tufts Medical Center created the CEVR Global Health CEA (GH CEA) registry, a database of cost-effectiveness analysis (CEA) studies that evaluate health interventions from around the world. The Global Health CEA registry focuses on those interventions designed to mitigate disease burden in countries at various stages of industrial development.

The Global Health Cost Effectiveness Analysis (GH CEA) Registry is a free database that compiles research literature on the economic value of global health interventions. Our inclusion criterion for contributing articles is contingent on its application of the "cost-per-DALY-averted" metric, which measures the cost-effectiveness of an intervention.

The GH CEA Registry is a repository of all peer-reviewed cost-per-DALY studies stratified by methods, cost-per-DALY ratios, and disability weights published since the 1990s.

Global health organizations acknowledge the importance of prioritizing limited health care resources, but the question remains: are we spending our money wisely? Cost-effectiveness analysis can help stakeholders gain a better understanding of the return on investment of global health interventions and has the potential to inform smart investments and maximize the impact on population health.

Methods

- Global Burden of Disease Classification & ICD-10
- Primary, Secondary & Tertiary Prevention Classification
- Funding Source
- Study Perspective

Cost-Per-DALY Ratios

- Target Population
- Intervention & Comparator
- Costs & DALYs
- Incremental Cost-Effectiveness Ratio (ICER)

Disability Weights

- Disease
- Disability Weight
- Source

GH CEA Registry Overview Brochure

Click here for a downloadable and printer-friendly pdf of the GH CEA Registry Overview Brochure. The brochure provides insight into our cost-per-DALY database, its contents and a succinct "getting started" section.

BILL & MELINDA GATES foundation | Tufts Medical Center | INSTITUTE FOR CLINICAL RESEARCH AND HEALTH POLICY STUDIES | The Center for the Evaluation of Value and Risk in Health

ghcearegistry.org

GH CEA Registry Dashboard

Disease

Country

Intervention

Select your country:

South Africa

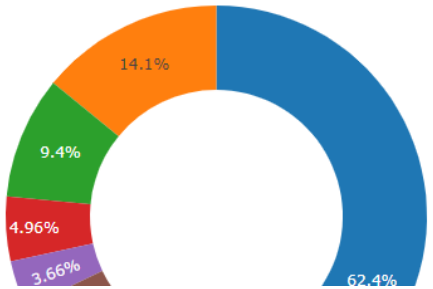
Registry Contents:

Number of studies	76
Number of ratios	383
Range of ICERs (2018 USD)	Cost-Saving - Dominated
Number of unique interventions	318
Number of unique diseases	52

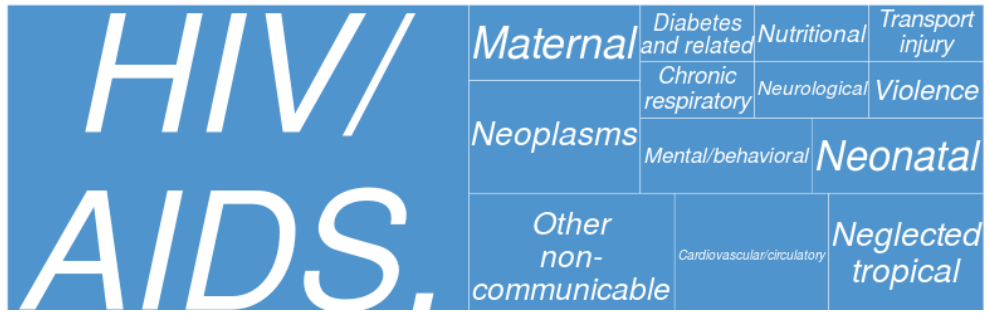
Top 5 Selected Cost-Effective Interventions:

Intervention	Target Population	Cost/DALY averted	Source (Title, Author)
Diagnostic, Screening: Rapid plasma reagin plus Treponema pallidum passive particule agglutination assay for prenatal serological screening	Healthy ; Women ; Age: Adolescents: 12-18 years ; Pregnant	Cost-Saving	Cost-effectiveness of a dual non-treponemal/treponemal syphilis point-of-care test to prevent adverse pregnancy outcomes in sub-Saharan Africa. (Owusu-Edusei)
Diagnostic, Screening: Rapid plasma regain (RPR) test for prenatal serological screening	Healthy ; Women ; Age: Adolescents: 12-18 years ; Pregnant	Cost-Saving	Cost-effectiveness of a dual non-treponemal/treponemal syphilis point-of-care test to prevent adverse pregnancy outcomes in sub-Saharan Africa. (Owusu-Edusei)
Diagnostic, Screening: New dual treponemal/nontreponemal point-of-care test (Dual-POC) for prenatal serological screening	Healthy ; Women ; Age: Adolescents: 12-18 years ; Pregnant	Cost-Saving	Cost-effectiveness of a dual non-treponemal/treponemal syphilis point-of-care test to prevent adverse pregnancy outcomes in sub-Saharan Africa. (Owusu-Edusei)
Diagnostic, Screening: Point-of-care treponemal immunochromatographic strip (ICS) test for prenatal serological screening	Healthy ; Women ; Age: Adolescents: 12-18 years ; Pregnant	Cost-Saving	Cost-effectiveness of a dual non-treponemal/treponemal syphilis point-of-care test to prevent adverse pregnancy outcomes in sub-Saharan Africa. (Owusu-Edusei)
Diagnostic, Screening: New dual treponemal/nontreponemal point-of-care test (Dual-POC) for prenatal serological screening	Healthy ; Both women and men ; Age: Children: 0-5 years	Cost-Saving	Cost-effectiveness of a dual non-treponemal/treponemal syphilis point-of-care test to prevent adverse pregnancy outcomes in sub-Saharan Africa. (Owusu-Edusei)

Distribution of Ratios by Intervention Type



Distribution of CEAs by Disease Area



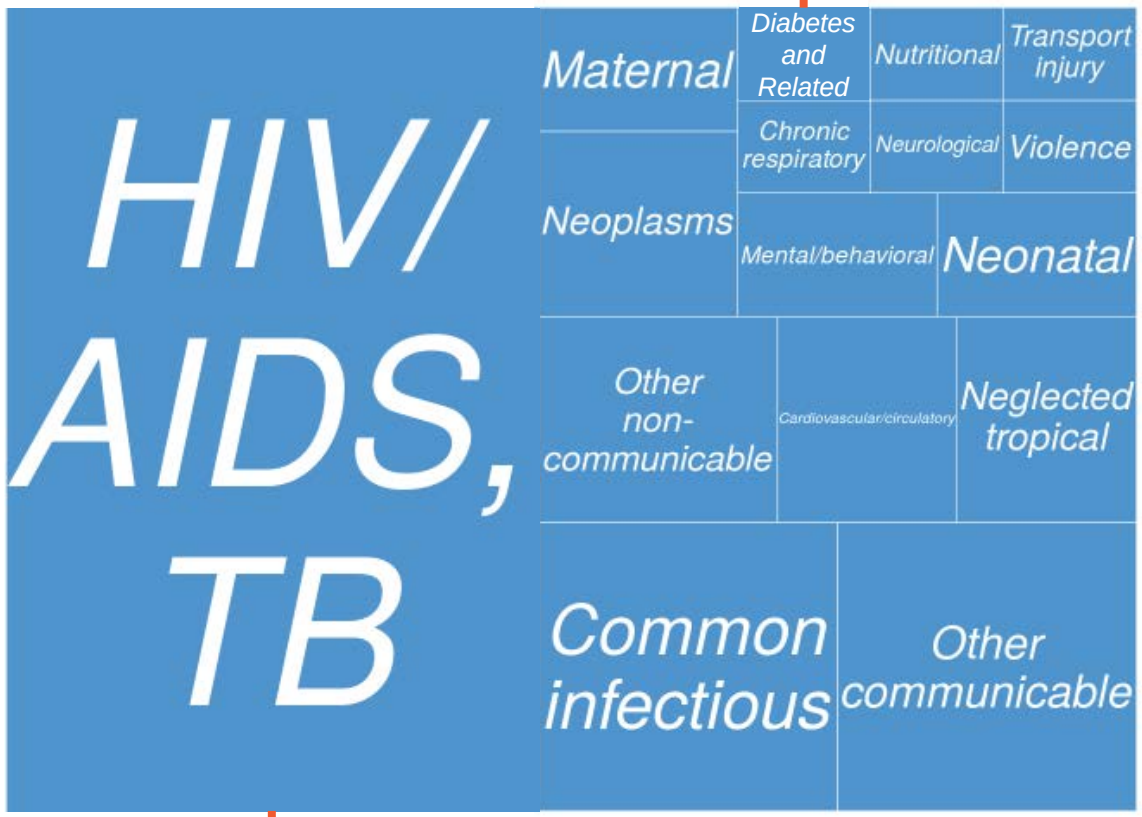
Cite the GH CEA Registry!
Developer:
Joanna Emerson

CEVR Center for the Evaluation of Value and Risk in Health

BILL & MELINDA GATES foundation

3 studies

Distribution of CEAs by Disease Area for South Africa



38 studies

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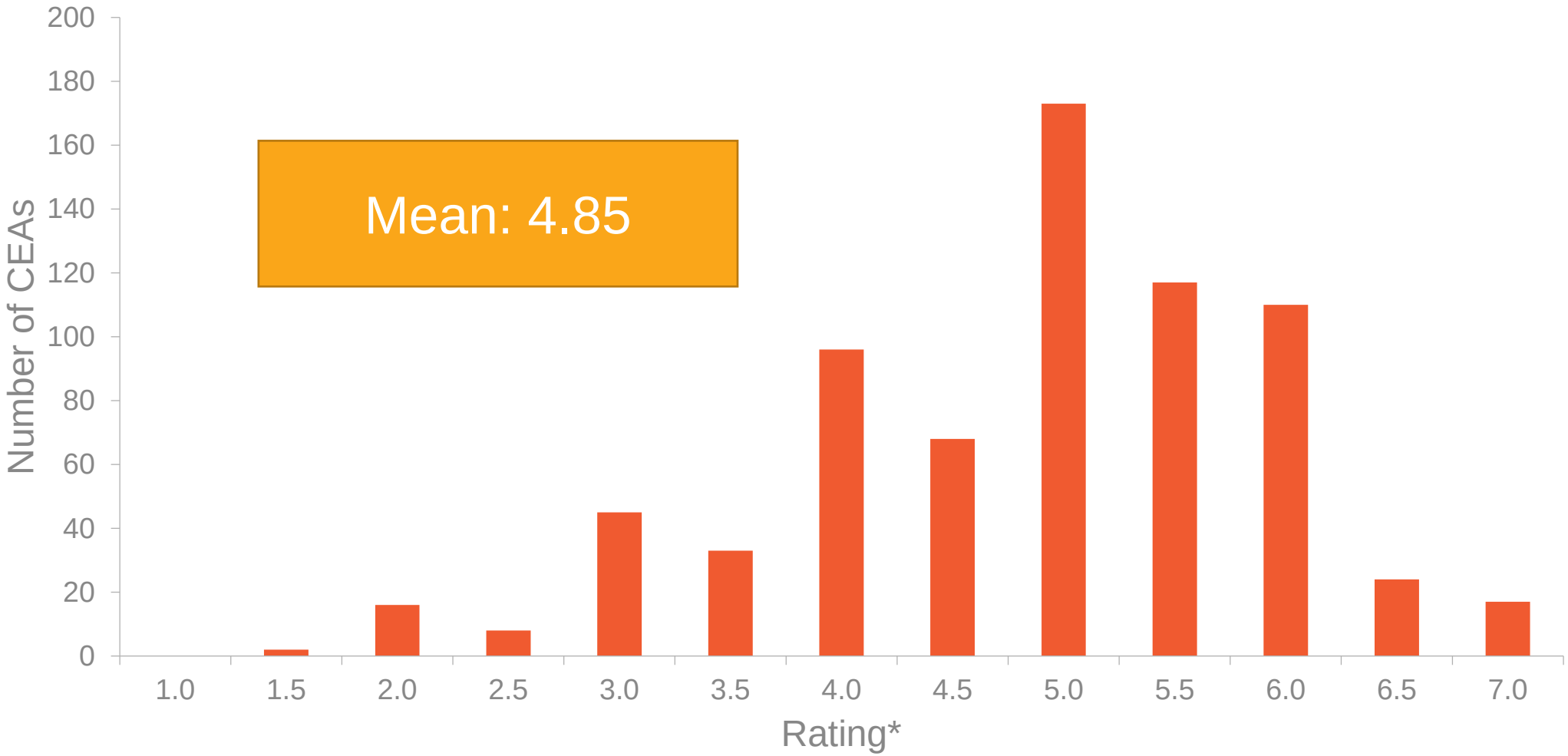
Cost-per-DALY studies: quality scores



*1 is lowest, 7 is highest

PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Adherence to the iDSI reference case among published cost-per-DALY averted studies

Joanna Emerson, Ari Panzer, Joshua T. Cohen, Kalipso Chalkidou, Yot Teerawattananon, Mark Sculpher, Thomas Wilkinson, Damian Walker, Peter J. Neumann, David D. Kim

Published: May 1, 2019 • https://doi.org/10.1371/journal.pone.0205633

Reference Case principles

Principle
Transparency
Comparator(s)
Evidence
Health outcome
Resource use/costs
Time horizon/discount rate
Non-heath effects/costs
Heterogeneity
Uncertainty
Budget impact
Equity

Methods:

- Decision problem characterized
- Limitations characterized
- Declarations of interest identified

Reporting:

- Clearly describe population, intervention, comparator(s), outcomes
- Limitations stated
- Conflict of interest statement available
- Source of funding stated

Adherence to all 11 principles*:

- Methodological specifications: 60%
- Reporting standards: 74%
- Budget impact and equity seldom addressed

**Emerson et al. 2019 PLOS One*

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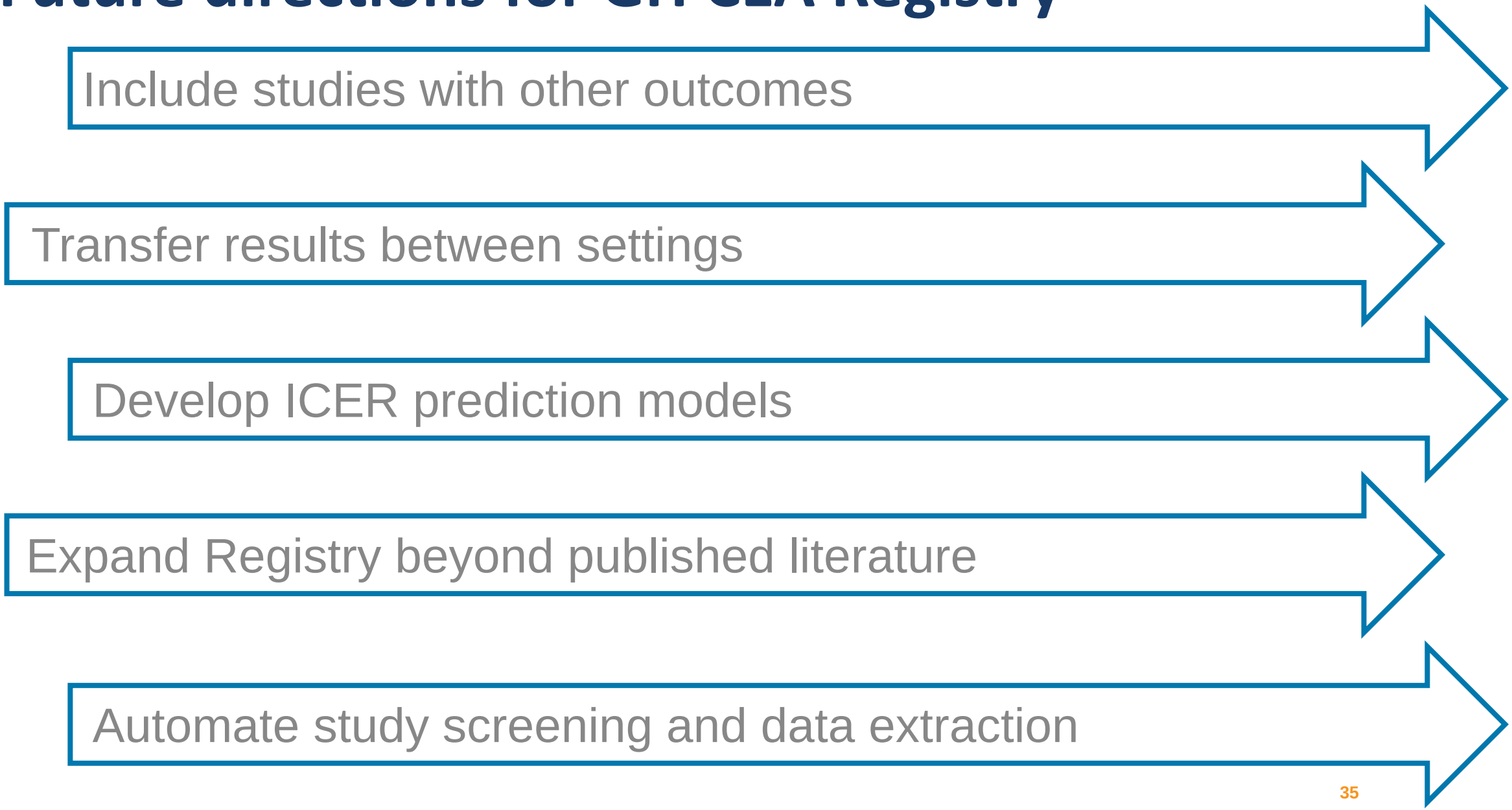
Summary

- CEA literature in global health continues to grow
- CEA should keep pace with shifts in disease burden
- Need to improve study quality and adherence to reference case
- Policy should consider geography and context-relevant studies

Future directions for GH CEA Registry



Discussion:

“No UHC without… evidence of value for money”

Kalipso Chalkidou, MD, PhD
Director, Global Health Policy and Senior Fellow, CGD
Professor of Practice in Global Health, Imperial College London
Lead, international Decision Support Initiative

A few thoughts

Transition from aid is a reality and is putting serious pressures on healthcare budgets alongside political commitments to UHC, the rise of chronic disease and comorbidities and technological innovation.

Aggregated regional lists of Best Buys are a useful start but contextualization is needed to inform investment (or disinvestment decisions): this is why the Tufts Registry is of such great value.

A standardized and fit-for-purpose approach to economic evaluation is of the essence for evidence of efficiency and distribution to be useful to policy makers locally. This includes:

- a locally relevant methods agenda
- decision rules reflecting local opportunity costs

Institutionalising evidence informed, accountable priority setting is not an optional extra in the journey towards UHC

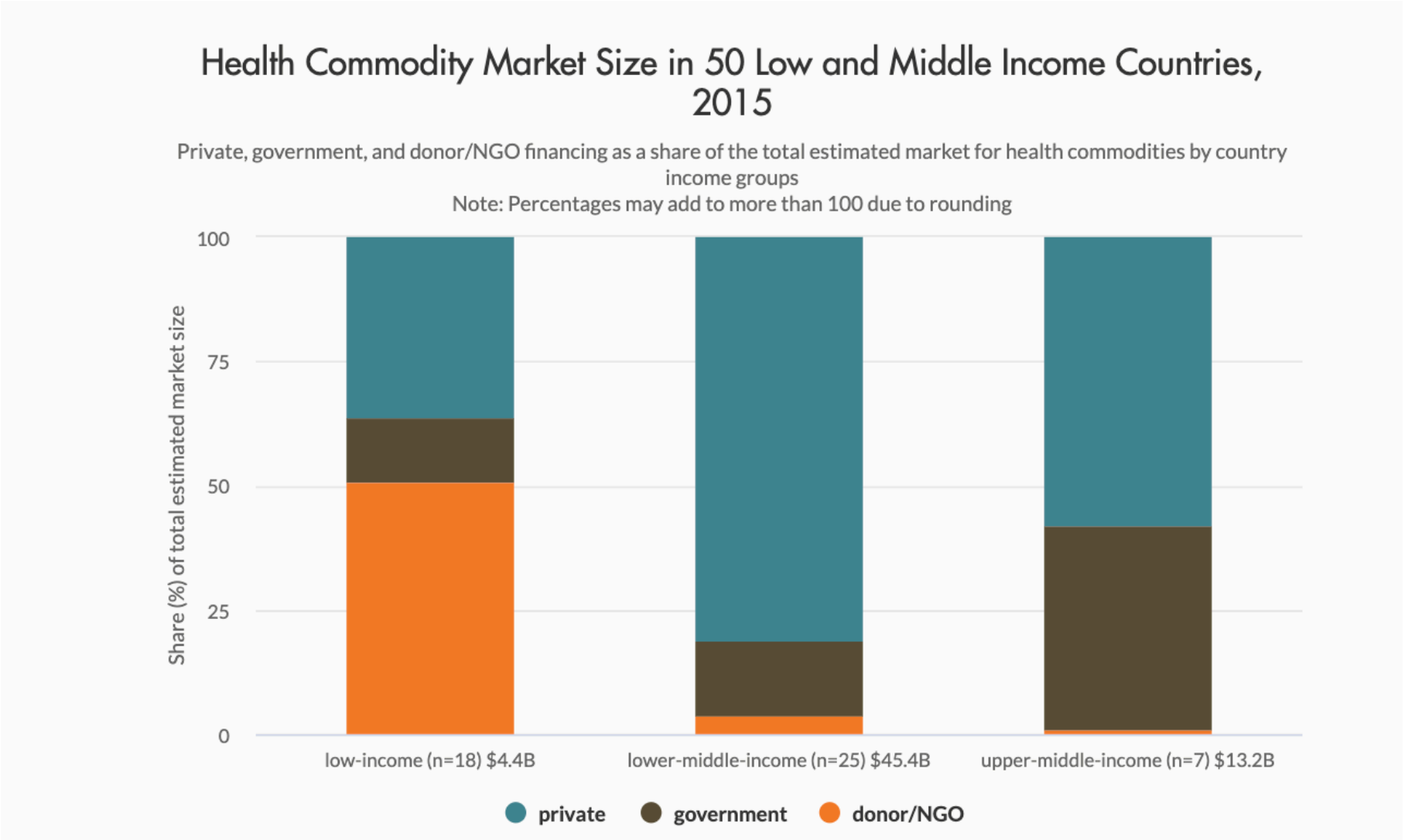
The Tufts registry is a global public good worth supporting alongside other similar initiatives such as the repository of open access CEA models.

Transition from aid is for real…

Table 11. Countries at High Fiscal Risk from Global Health Transitions, 2015-2040

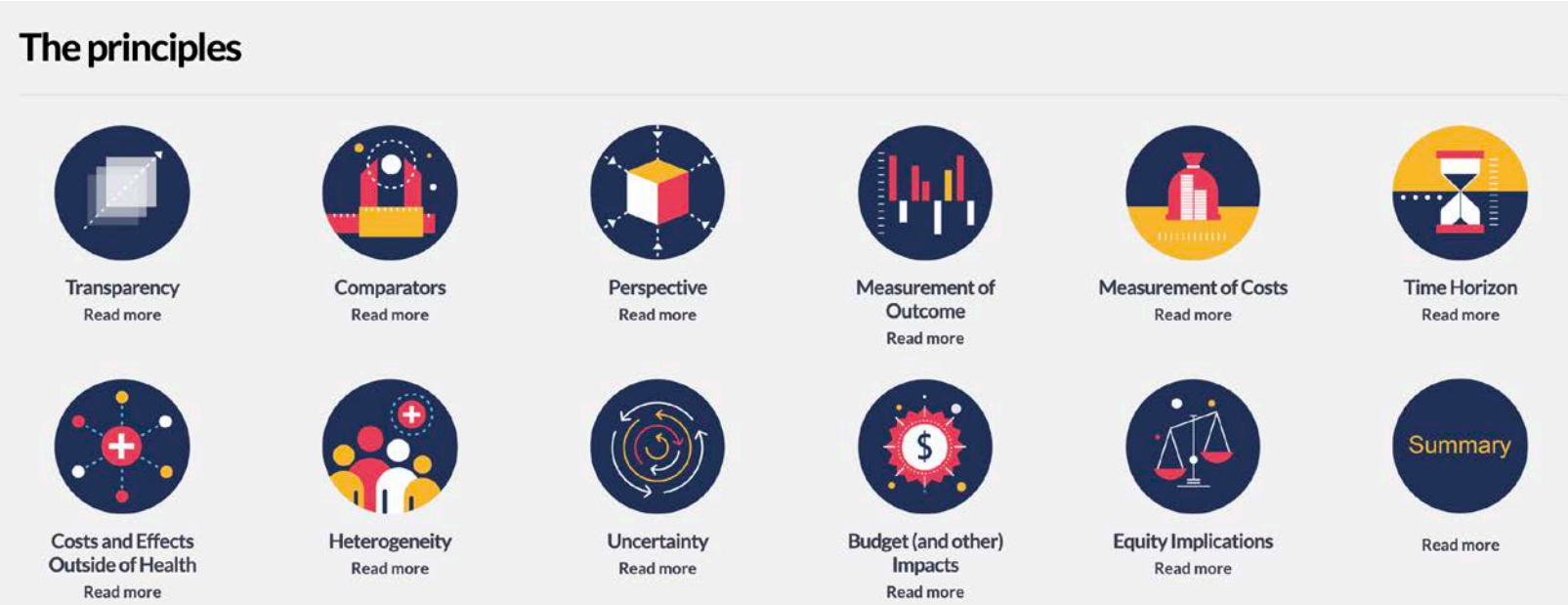
Country	Funding Mechanism	2015	2020	2025	2030	2035	2040	As % of GGHE-D (2015)	Total (Simultaneous Transitions) as % of GGHE-D (2015)	Simultaneous Transitions	Highest Risk Period
Afghanistan	GPEI		T T T T T					85.1%	85.1%		2017-2022
Cameroon	Gavi	P P P P P P P P P P P P P	AT AT AT AT AT	G G G G G G G G G				3.5%	17.1%	IDA, GPEI, PEPFAR	2017-2022
	GPEI		T T T T T					4.2%			
	IDA	O O O O	O O O O

Gap left by donors filled by private out of pocket spending



https://www.cgdev.org/publication/initial-estimation-size-health-commodity-markets-low-and-middle-income-countries

iDSI Reference Case: work in progress



Appropriate discount rates for fast growing economies: do we borrow the US/EU rates?

Appropriate outcome measure: is the DALY still relevant in LMICs?

How can economic returns to health investments be credible to Treasuries

- eg productivity vs survival gains/consumption losses, monetisation of health outcomes, unrealistic fiscal gains

What is the right perspective (social vs healthcare sector)?

What is cost effective AND affordable?

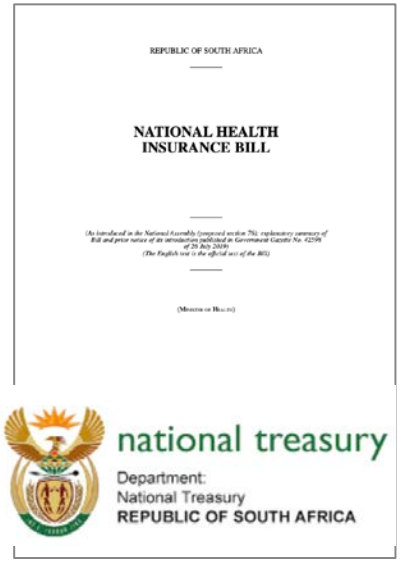
https://www.idsihealth.org/resource-items/idsi-reference-case-for-economic-evaluation/#principles

Institutionalisation of HTA: national governments forging ahead

National Health Insurance Act of 2013, Section 11- Excluded Personal Health Services
"The Corporation shall not cover expenses for health services which the Corporation and the DOH consider cost-ineffective through health technology assessment…"

国家卫生计生委卫生发展研究中心
China National Health Development Research Center

(4) Treatment must not be funded if a health care service provider demonstrates that— (a) no medical necessity exists for the health care service in question; (b) **no cost-effective intervention exists for the health care service as determined by a health technology assessment;** or (c) the health care product or treatment is not included in the Formulary, except in circumstances where a complementary list has been approved by the Minister


REPUBLIC OF SOUTH AFRICA

NATIONAL HEALTH INSURANCE BILL

national treasury
Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

Minister of Health's Decree No. 71 /2013 Article 34

(5)Health Technology Assessment Committee **provide policy recommendation to the Minister on the feasibility of the health service** as referred to in paragraph (4) **to be included as benefit package of National Health Insurance**

सत्यमेव जयते
MINISTRY OF HEALTH & FAMILY WELFARE

CNHDRC HTA incubator with over 33 regional research institutes and unis informing pricing negotiations, procurement and listing to national insurance list.

"the India Medical Technology Assessment Board for evaluation and appropriateness and cost effectiveness of the available and new Health Technologies in India…**standardized cost effective interventions that will reduce the cost and variations in care, expenditure on medical equipment…overall cost of treatment, reduction in out of pocket expenditure of patients…**'. Ref: MTAB, Ministry of Health & Family Welfare, Government of India

ICER information: necessary condition for sustainable UHC

Open-Source Model Clearinghouse

Use the menus below to filter data. Multiple selections are permitted:

Disease: Begin typing disease...

Country: Begin typing country...

Intervention: Begin typing intervention...

Model type: Begin typing model type...

Software type: Begin typing software...

Model/project sponsor: Begin typing sponsor...

Author last name: Begin typing author...

Last update year: 2009 – 2019

Show 10 entries

Open-Source Models: Click OSF link to see abstract and source code

Model Title	Primary Author	Intervention	Disease	Country	Model type	Software	Model sponsor	Date of last update	Link to source code
Cost-effectiveness of government ART program in Zambia	Elliot Marseille	Pharmaceutical	HIV/AIDs and Tuberculosis	Zambia	Other (Cost and cost-effectiveness)	Excel, Stata	Government	March/6/2012	https://osf.io/xmnvy/
Community mobilisation through womens groups and quality improvement in health facilities in Malawi	Tim Colbourn	Care delivery	Maternal disorders	Malawi	Not reported	R	Not reported	January/1/2009	https://osf.io/8zc5s/
Mass drug administration strategies for schistosomiasis and soil-transmitted helminthiasis in Cote d'Ivoire	Nathan Lo	Pharmaceutical	Other non-communicable disease	Cote d'Ivoire	Not reported	SAS	Not reported	October/1/2015	https://osf.io/pcf3y/
Alcohol Use Disorder	David Kim	Care delivery, Pharmaceutical	Mental and behavioral disorders	United States of America (USA)	Markov/Transition model	Stata	Not reported	January/1/2017	https://osf.io/jvayu/

Another great global public good from Tufts!

Audience questions and answers

GLOBAL HEALTH | CEA REGISTRY

ghcearegistry.org

For registry support & inquiries
Rachel Bacon
rbacon1@tuftsmedicalcenter.org