Session 7: Guidelines to conducting guality economic evaluation

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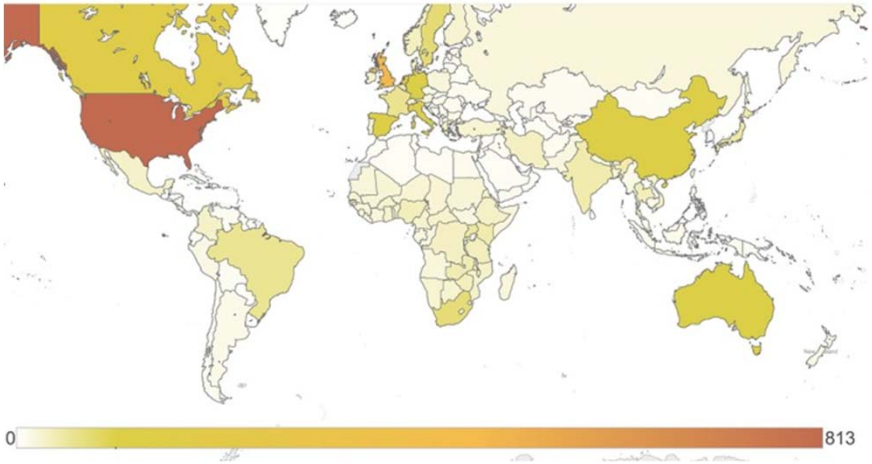
New resources to improve economic evaluation in LMIC

- Overview
- Reference case approach
  - Economic Evaluation
  - Global Health Costing
  - Benefit Cost analysis
- Resources
  - Websites
  - Costing tools
  - Disease Control Priorities
  - IHME

Generating quality evidence for decision making

- Economic evaluations should be…
  - Robust
  - Transparent
  - Transferable
- Guidelines or standardized approaches can…
  - Improve the quality of evaluations
  - Increase comparability and transferability of results
  - Benefit policy makers and funders

Number of economic evaluations in each country (2012-2014)



Source: Pitt. C. Economic Evaluation in Global Perspective: A Bibliometric Analysis of Recent Literature, *Health Economics* 2016

Pathways to quality

- Guidelines for conducting CEAs in
- high-income countries
  - i.e. UK National Institute for Health and Care Excellence (NICE)
  - US Panel on Cost-Effectiveness in Health and Medicine (1996)
  - New (Second) US Panel on Cost-Effectiveness in Health and Medicine (2016)
  - Increasing number of CEAs being
  - conducted in LMIC.
  - Economic evaluations increasingly supported by donor funds in global health


Clinical Review & Education

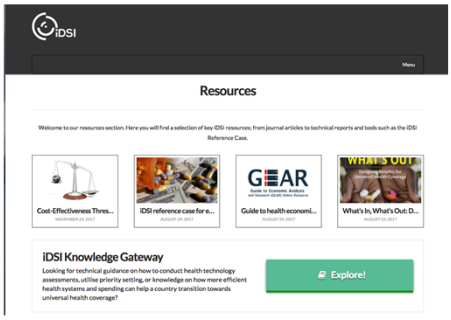
JAMA | Special Communication

Recommendations for Conduct, Methodological Practices, and Reporting of Cost-effectiveness Analyses

Second Panel on Cost-Effectiveness in Health and Medicine

iDSI reference case for economic evaluation

- Builds on NICE International (UK) and partners
- Funded by the Bill and Melinda Gates Foundation
- Principle-based approach to guide planning, conduct and reporting of economic evaluations.



What is a reference case?

- A reference case sets out the principles, methodological specifications and reporting standards that support high quality and comparable analyses.

The Principles

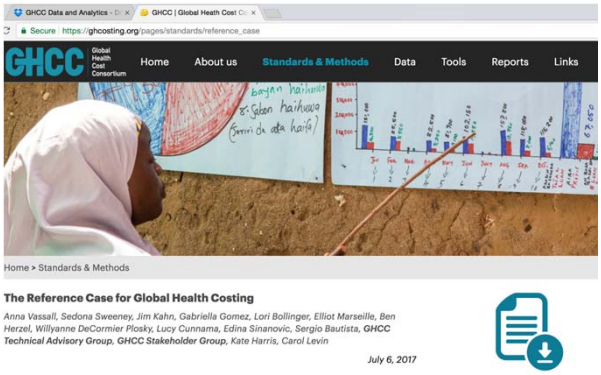
- Transparency
- Comparators
- Perspective
- Measurement of Outcomes
- Measurement of Costs
- Time Horizon
- Cost and effects outside of health
- Heterogeneity
- Uncertainty
- Budget impacts
- Equity implications

Statement of Principle

1	An economic evaluation should be **communicated clearly and transparently** to allow the decision maker to **interpret** the methods and results to make a fully-informed decision
2	The **comparators** against which costs and effects are measured should be an accurate reflection of the decision problem.
3	An economic evaluation should consider **all available evidence that is relevant** to the decision problem
4	The **measure of health outcome** should be appropriate to the decision problem, should capture measurement of both length of life and quality of life, and should be generalisable across disease states
5	All differences in the expected **resource use and costs** of delivering interventions to the target population(s) should be incorporated into the evaluation.

Statement of Principle

6	The **time horizon** used in an economic evaluation should be of sufficient length to capture all costs and effects **relevant to the decision problem**; an appropriate **discount rate** should be used to discount cost and effects to a present value
7	**Non-health effects** and **costs that do not fall on the health budget** should be identified where relevant to the decision problem. All **costs and effects should be disaggregated**, either by sector of the economy or by who incurs them.
8	The **effect** of the intervention on **sub-populations within the decision problem** should be **explored** and the **implications** appropriately **characterized**
9	The **uncertainty** associated with an economic evaluation should be appropriately characterized
10	The impact of implementing the intervention on **health budget and on other constraints** should be clearly and separately identified.
11	An economic evaluation should explore the **equity implications** of implementing the intervention.



Improving standards in costing:

The Reference Case for Global Health Costing

Why set standards in costing?

- Improving the nature and extent of use of cost data:
  - Systematic reviews of costs suggest a wide variety of costing methods and metrics
  - Poor quality may lead to poor decisions - but how to judge poor quality
- Improving the production of cost data
  - Inefficiency – what is important?
  - Limited use of current guidelines
  - Limited capacity in costing

What do we want to achieve?

Costing is a process of estimation
Two characteristics of a good estimate:

- Precision
- Accuracy

But how accurate and precise is good enough?

- Depends on the decision to be made using the cost

Other characteristics

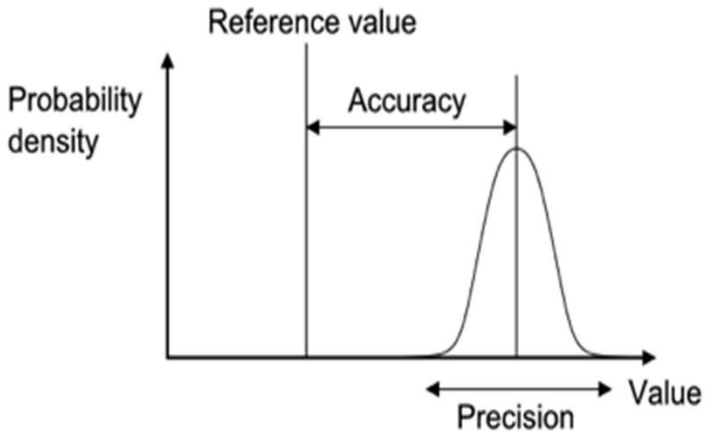
Generalisability

- Can we apply the cost to other settings?
- *More important to be relevant to context?*

Comparability

- Are cost estimates comparable with on another?

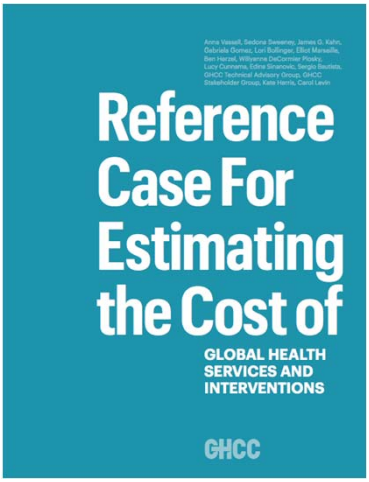
What makes a good estimate?



Building on the iDSI 'reference case' approach

1. Set of 'acceptable' principles
2. Methodological guidance on how to achieve those principles (theory and evidence based)
3. Standardisation for specific interventions with additional guidance where available
4. Reporting standards

The GHCC Reference Case



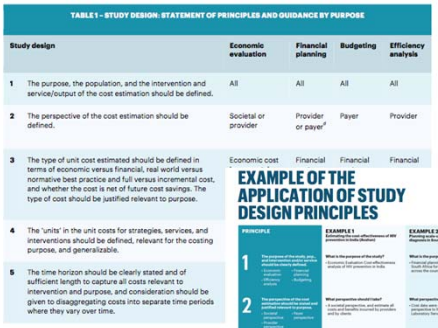
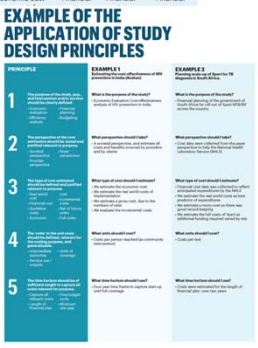


TABLE 1 – STUDY DESIGN: STATEMENT OF PRINCIPLES AND GUIDANCE BY PURPOSE

	Study design	Economic evaluation	Financial planning	Budgeting	Efficiency analysis
1	The purpose, the population, and the intervention and service/output of the cost estimation should be defined.	All	All	All	All
2	The perspective of the cost estimation should be defined.	Societal or provider	Provider or payer[a]	Payer	Provider
3	The type of unit cost estimated should be defined in terms of economic versus financial, real world versus normative best practice and full versus incremental cost, and whether the cost is net of future cost savings. The type of cost should be justified relevant to purpose.	Economic cost	Financial	Financial	Financial
4	The 'units' in the unit costs for strategies, services, and interventions should be defined, relevant for the costing purpose, and generalizable.				
5	The time horizon should be clearly stated and of sufficient length to capture all costs relevant to intervention and purpose, and consideration should be given to disaggregating costs into separate time periods where they vary over time.				



Reference case principles: Principles 1-5, Study design

		Economic evaluation	Financial planning	Budgeting	Efficiency analysis
Study design					
1	The **purpose, the population, and the strategy, service or intervention** of the cost estimation should be defined.				
2	The **perspective** of the cost estimation should be defined.	*Societal and provider*	*Provider*	*Payer*	*Provider*
3	The **type** of cost estimated should be defined in terms of **economic vs financial, real world vs guideline,** and **incremental vs full cost,** and whether the cost is **net of future cost savings;** and justified relevant to purpose**.**	*Economic cost Incremental cost*	*Financial cost*	*Financial cost*	*Financial cost Full cost*
4	The '**units**' in the unit costs for strategies, services, and interventions, should be defined, relevant for the costing purpose and generalizable.				
5	The **time horizon** should be of **sufficient length** to capture all costs relevant to intervention and purpose, and consideration should be given to disaggregating costs into separate time periods where they vary over time.	*To capture all costs*	*Length of financial plan*	*One budget cycle (usually one year)*	*Minimum one year*

Reference case principles: Principles 6-10, Measurement

	Service and resource use measurement	***Economic Evaluation***	***Financial Planning***	***Budgeting***	***Efficiency analyses***
6	The scope of the **inputs** to include in the cost estimation should be defined and justified relevant to purpose.	*All costs defined as incremental, but the analysis can address omissions or uncertainty*	*Depending on purpose and time-frame*	*All inputs for the relevant budget holder*	*All inputs identified in the production process being analyzed*
7	The methods for estimating the **quantities of inputs** should be described, including methods, data sources and criteria for allocating shared costs.				
8	The **sampling frame, method and size** should be determined by the precision demanded by the costing purpose and designed to minimize bias.	*Consider methods that used for establishing differences in ICERs*	*May required costs collected for different types of service providers*		*May consider sample sizes that establish significance of specific cost determinants*
9	The **selection of the data source and methods for estimating 'units'** should be described, with potential biases reported in the study limitations.				
10	Consideration should be given to the **timing of data collection** to minimize recall bias and, where relevant the impact of seasonality and other differences over time.				

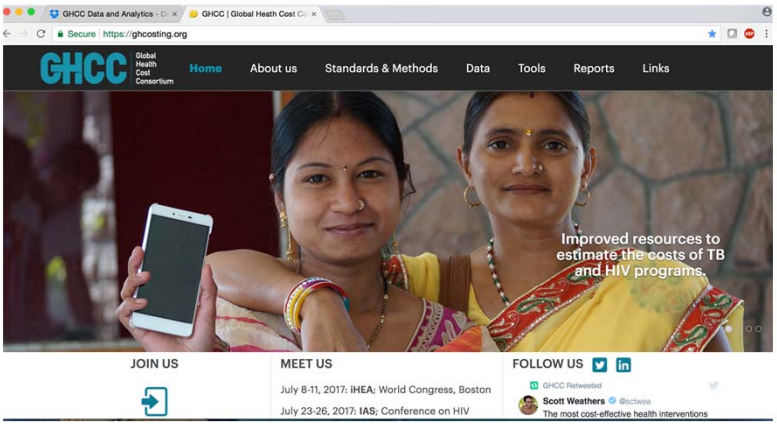
Reference case principles: Principles 11-14, Valuation

		Economic evaluation	Financial planning	Budgeting	Efficiency analysis
Valuation and pricing					
11	The sources for price data should reflect the **full value** of the input and be described for each input in a way that allows for **adjustment across settings**.				
12	**Capital costs** should be appropriately annuitized or depreciated to reflect the expected life of capital inputs	*Annuitization*	*Depreciation*	*Depreciation*	*Depreciation*
13	Where relevant an appropriate **discount rate, inflation, and currency conversion rates** should be used and clearly stated.	*3% should be used as well as local rates*			
14	The use and source of **shadow prices**, for goods where no market price exists, and for the opportunity cost of time should be reported.	*Shadow prices should be applied to reflect full opportunity cost*			

Reference case principles: Principles 15-17, Present results

Presenting results			
15	Variation in the cost of the intervention by site size/organization, sub-populations, or by other **drivers of heterogeneity** should be explored and reported.	*Methods may need to consider correlation with effectiveness*	*Cost function analysis to understand drivers of costs*
16	The **uncertainty** associated with cost estimates should be appropriately characterized.	*Simple and probabilistic sensitivity analyses*	
17	Cost estimates should be **communicated clearly and transparently** to enable decision-maker(s) to **interpret and use** the results.		

Visit the GHCC website!



www.ghcosting.org

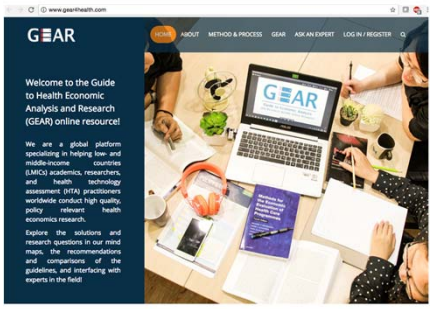
Guidelines for Benefit-Cost Analysis

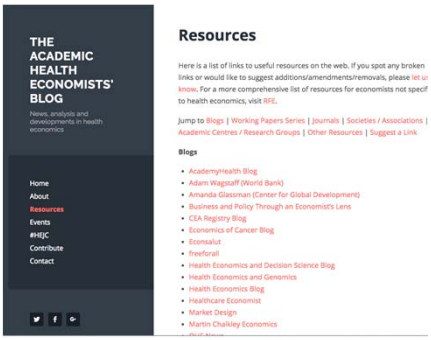
- Harvard University.
- Funded by BMGF.
- Developing guidelines to encourage the conduct of high. quality benefit cost analysis.
- Build on the existing iDSI reference case.
- Aligned with GHCC RC.

Some fun additional resources

Guide to Health Economic Analysis and Research (GEAR) online resource

The Academic Health Economists Blog https://aheblog.com/resources/





Quick overview of costing and resource allocation tools

A teaser!
Thanks to Monisha Sharma

Uses of costing tools

- **Budget planning:** Governments and local health agencies can use tools to help in planning and budgeting processes
- **Decision making:** Target coverage, eg 50% of HIV positive persons on ART or impact guided: 30% reduction in HIV incidence.

	Coverage-guided decision making	Impact-guided decision making
With budget constraint		
No budget constraint		

- **Costing interventions and health outcomes**: Determining the costs and effectiveness (e.g. death or disease averted) associated with different interventions. Conducting a cost-effectiveness anaylsis

Costing tools can:

- Provide information on the cost of scaling up and sustaining health programs at different levels of the health system (and even for global programs)
- Aim to inform decision making and programming to achieve specific goals (i.e. sustainable development goals)
  - Help evaluate progress towards health targets, eg Millennium development goals: 17 health goals to be met over the next 15 years.

Focus of tools:

- Determine:
  - Cost of scale up package of interventions
  - Cost of achieving target coverage
  - Cost of strategic multi-year plan
  - Impact of resource allocation on an outcome

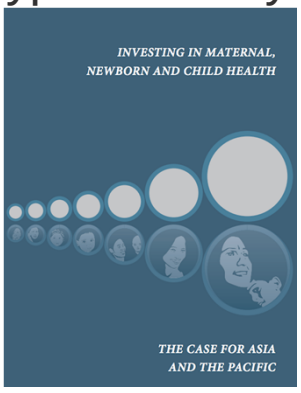
Characteristics of costing tools

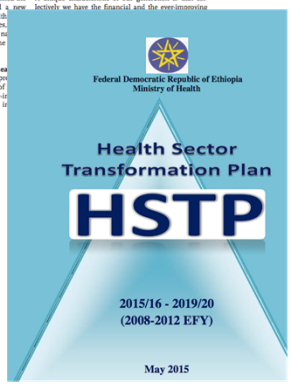
- Most of the tools are designed to be used after formal training
  - Although it is possible to download and learn the tools on your own
- It's difficult to understand how the tools operate (black boxes). Even with user guides the computations are not clearly outlined
- Most are Excel-based
- Use the ingredients/bottom-up costing
- Each tool uses a different approach and different logic. Optimal tool depends on research question and available data.

List of some costing tools and resource allocation models

- Reproductive Health (RH) Costing Tool
- Integrated Healthcare Technology Package (iHTP) Simulation Tool
- Spectrum: PMTCT Cost Effectiveness
- Goals Model
- Planning, Costing and Budgeting Framework (PCBF)
- CORE Plus
- Integrated Health Model
- Planning & Budgeting for TB Control
- Resource Needs Model HIV/AIDS
- One Health Model

Types of analyses conducted with tools





Tools used by:
WHO, UNAIDS
Commissions, eg Lancet commission on Global Health 2035 which estimated cost to scale up interventions to lower mortality rates in developing countries. This may be academic or research organizations who do the work. National governments use tools in their health sector strategic planning—either MOH staff or consultants

Choosing the right tool

Tool Name	Marginal Budgeting for Bottlenecks	Reproductive Health (RH) Costing Tool	Planning & Budgeting for TB Control	Spectrum: PMTCT Cost Effectiveness	Goals Model	Resource Needs Model HIV/AIDS	CORE Plus	Integrated Health Model	One Mo
Tool developer	UNICEF / World Bank	UNFPA	WHO / MRC	Constella Futures/ Futures Institute	Constella Futures/ Futures Institute	MSH	MSH	UNDP	WHO
Objective	To identify bottlenecks and model impact of reducing them to increase coverage of	To help users estimate cost to scale up a package of reproductive health services from	To help users improve health service delivery by identifying the optimal mix of resources needed for interventions. Can also determine	To evaluate costa and benefits of various strategies to prevent mother-to-child transmission of HIV and	Tool allows users to determine the effect of resource allocation onachievement of HIV/AIDS	To translate strategic program goals into costs and budgets, calculate funding gaps--originally designed for	To estimate the expected number of each type of intervention and the	To estimate scale-up costs of health system as a whole to ensure capacity to deliver	To dev compr budget recom
Intended users	Health economists & policymakers at MOHs	Health planners at the country level	Planners, decision-makers and managers at all levels of healthcare system, technical assistance	Public sector policy makers and planners	National, multidisciplinary team of government planners and civil society	National and sub-national policy makers and planners, program-specific technical	Planners and managers of government, private	Health system planners	TB pro the co
Built in interventions	PMTCT including counseling ART, and feeding counseling. Condom use. Cotrimoxazole prophylaxis for HIV+ adults and children of HIV+ mothers, ART for	HIV/AIDS prevention and treatment, family planning, newborn health interventions. Condom promotion for commercial sex workers, MSM, and other vulnerable populations.	6,000 built-in WHO scenarios.	7 interventions: Long-course ZDV, Short-course ZDV (Thailand regimen), Shortcourse ZDV - PETRA Arm A, Short-course ZDV - PETRA Arm B, Neonatal only, Nevirapine HIVNET 012 protocol, Universal	VCT, social marketing, behavior change interventions for high-risk/vulnerable populations including MSM, sex workers, and IDU. Condom promotion, PMTCT, ARVs, M & E, capacity building.	N/A. User inputs strategic plan with coverage target, health outcomes, costs and quantities.	Scenarios-- A: Actual services and actual costs; B: Actual services and normative costs; C: Needed services and normative costs; D: Projected	HIV/AIDS home-based & palliative care, ARVs, treatment of OIs, nutrition, other STIs, facilities, vehicles, human resources, HIV prevention for vulnerable populations, condom	HIV te patient TB pati HIV tre
Assumptions	Reductions in bottlenecks are hierarchical and reduction of one has a cascading downstream affect, Efficacy stays	Data in tool is from sources like UN Population Division, WHO's Burden of Disease, UNICEF, Demographic Health	Medical equipment and pharmaceutical database based on WHO database, clinical guidelines, epidemiological profiles, other built-in data linked to International Statistical Classification of Diseases	Built-in demographics data, input prices and quantities and effectiveness, HIV vertical transmission rate	Default data on impact values, sexual behavior, costs, STI prevalence, cost-effectiveness interventions, HAART success rate and standard epidemiological	All assumptions are inputted by the user	User inputs intervention prices and quantities, and demographic and epidemiologic information.	Demographic data from UNFPA.	Defaul Global the Glo 2006-2 WHO/I and ep
Training	5 day training course needed, partially complete user's manual available. Using tool require a	1 to 4 days of training generally needed. Detailed user manual available. Skills required include finance,	3-5 day training workshop suggested and three to six months to use the tool and get results.. Post-training help file and resource kit available.	1 day of training to use. User manual available, knowledge of PMTCT programs needed. Tool free on internet.	Several days of training required. Takes users two weeks to set up the tool and get results from it. Users should have knowledge of	2-day training recommended. User's manual available.	3 day training suggested, users should possess skills in epidemiology,	1-2 day training suggested and user's manual available.	3 days weeks Help d manua user's
Software	Excel file	Excel file	Program-based (non-Excel)	Program-based (non-Excel)	Excel file	Excel file	Excel file	Excel file	Excel f
Ease of use	Intended for use with UNICEF or World Bank	Training and technical assistance needed to use	Technical assistance required.			Fairly simple to use			User fr
Website	http://www.aidstar-one.com/focus_areas/tre	http://www.who.int/pmnch/topics/economics/cos	http://www.who.int/pmnch/topics/economics/costing_tools/en/index9.ht	www.futuresinstitute.org/pages/resources.aspx	http://www.futuresinstitute.org/pages/resources.aspx		http://erc.msh.org/toolkit/Tool.cfm?lang	http://www.undp.org/poverty/tools.htm#nact	http:// ts/plan
Limitations	The ordering of bottlenecks appears to	This tool does not incorporate budget &	Does not include health outcome, health production function,	Does not consider service availability (counseling,	Does not incorporate macroeconomic conditions.		Does not incorporate	Does not incorporate budget & financing,	Does n effecti

THANK YOU

- WHO Guide summarizing available costing tools:

http://www.who.int/pmnch/knowledge/publications/costing_tools/en/

Thanks to Monisha Sharma at msharma1@uw.edu