Equity considerations in model-based economic evaluations

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Co-convened by TB MAC and CMMID

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- Create space for modellers and economists to connect and learn from each other's approaches to equity analysis and the inclusion of heterogeneity in modelling, economic evaluation, and priority setting;

- Generate discussion around the technical opportunities and challenges of evaluating equity in economic evaluations using mathematical modelling of infectious diseases;

- Inform recommendations on applying the equity principle of the reference case when using transmission model based economic evaluations
    - identifying the gaps (data and methods),
    - transparency in reporting

Day 1 – exploratory

Day 2 – decision/policy-driven

Transmission models are being used (increasingly) for priority setting to address equity issues

- ## TB MAC
  - inclusion of equity during last GFATM replenishment round;
  - Impact, cost and cost-effectiveness of aggressive TB control – including equity considerations (ECEA)
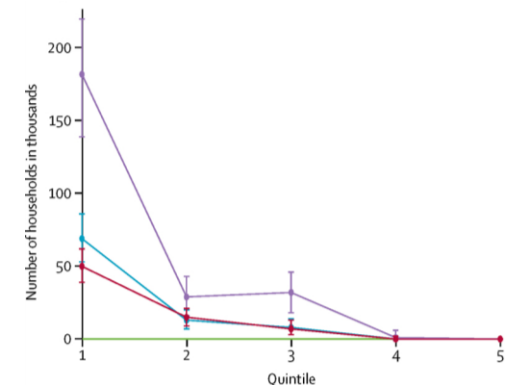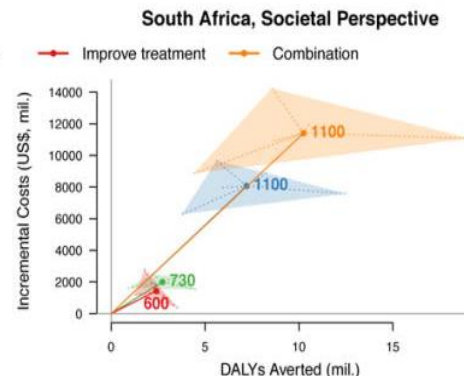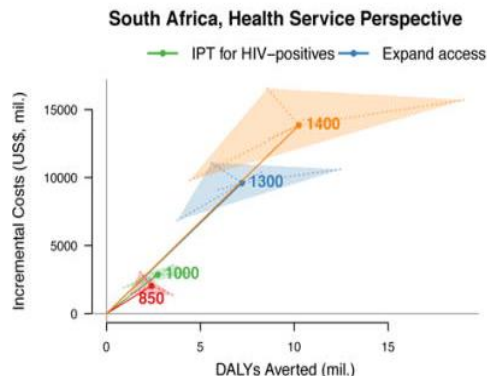
iDSI Reference Case to economic evaluations is a principle-based approach for analysts to guide the planning, conduct and reporting of economic evaluations.
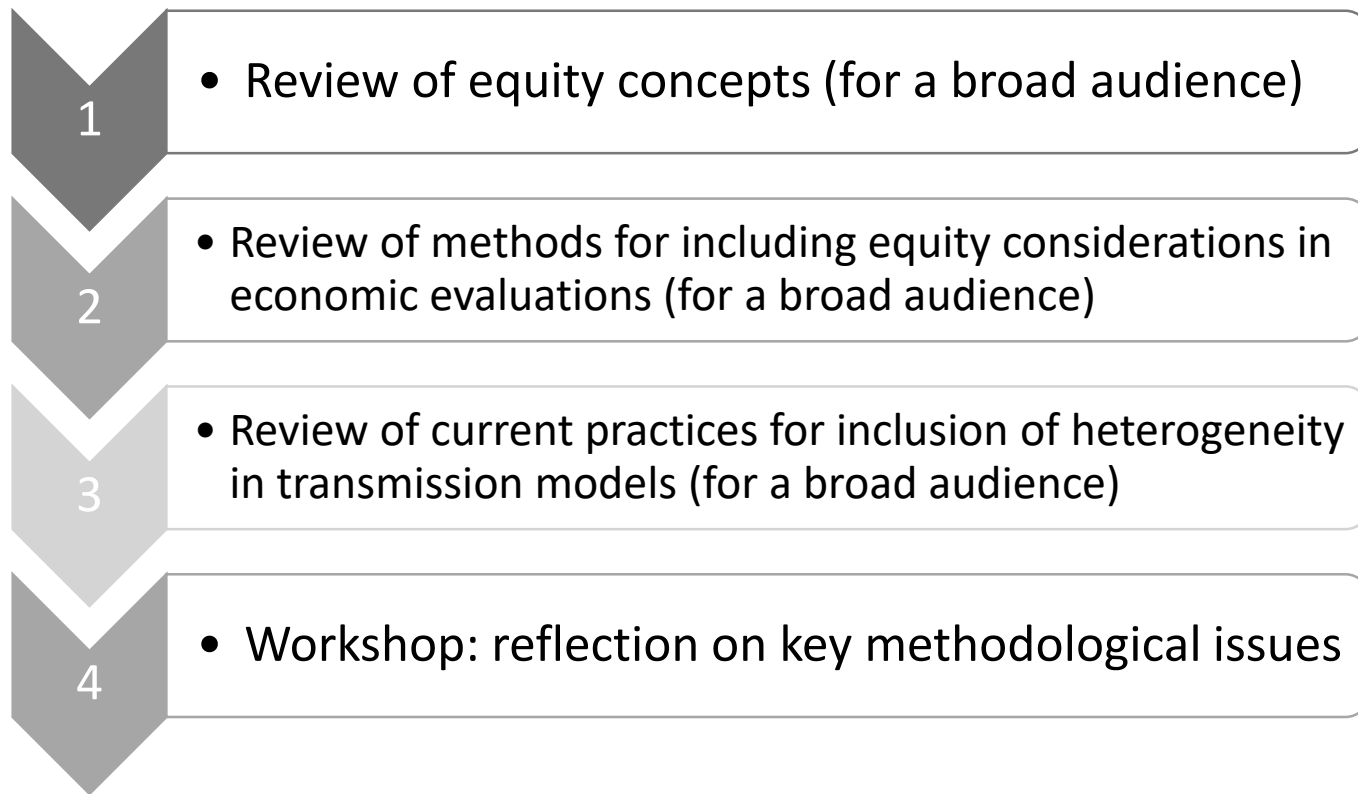

Related initiatives

- Harvard T.H. Chan School of Public Health are developing guidelines to encourage the conduct of high quality benefit-cost analyses.

- Global Health Cost Consortium developed a reference case for costing in global health

- TB MAC. Country modelling guidance

Aim: Identify key challenges and solutions in applying the iDSI Reference Case to economic evaluations using transmission models with a particular focus on principles 8 and 11

- Principle 8 (Heterogeneity) – the cost and effects of the intervention on sub-populations within the decision making problem should be explored and the implications appropriately characterised

- Principle 11 (Equity) – an economic evaluation should explore the equity implications of implementing the intervention

Table 1 – The iDSI Reference Case principles.

1. An economic evaluation should be communicated clearly and transparently to enable the decision maker(s) to interpret the methods and results.
2. The comparator(s) against which costs and effects are measured should accurately reflect the decision problem.
3. An economic evaluation should consider all available evidence relevant to the decision problem.
4. The measure of health outcome should be appropriate to the decision problem, should capture positive and negative effects on length of life and quality of life, and should be generalizable across disease states.
5. All differences between the intervention and the comparator in expected resource use and costs of delivery to the target population(s) should be incorporated into the evaluation.
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 present values.
7. Nonhealth effects and costs associated with gaining or providing access to health interventions that do not accrue to the health budget should be identified when relevant to the decision problem. All costs and effects should be disaggregated, either by sector of the economy or to whom they accrue.
8. The cost and effects of the intervention on subpopulations 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 the health budget and on other constraints should be identified clearly and separately.
11. An economic evaluation should explore the equity implications of implementing the intervention.

TB Modelling and Analysis Consortium

1
- Review of equity concepts (for a broad audience)

2
- Review of methods for including equity considerations in economic evaluations (for a broad audience)

3
- Review of current practices for inclusion of heterogeneity in transmission models (for a broad audience)

4
- Workshop: reflection on key methodological issues

Equity often defined in terms of differences that are *avoidable* and *unjust or unfair*

It implies a *value judgement* invoking <u>ethical frameworks</u> and <u>theories of social justice</u>

There is no universal consensus as to what can be considered fair in systematic differences (a normative question); variations across countries (and analysts) related to differences in political attitudes and values

Equity of what? Health economists have considered differences in health (outcomes), healthcare utilization (outputs) or healthcare financing (contributions)

Several frameworks to differentiate fair inequalities from unfair inequalities (inequities) have been proposed.

| Guiding principle |
| --- |
| Egality |
| Distribution according to entitlement |
| The 'decent minimum' |
| Utilitarianism |
| Rawlsian maximin |
| Envy-free allocations |
| Equity as choice |
| Equality in capabilities |

In resource allocation, the choice of principle for decision making will guide funding decisions.

Example: Global Malaria Programme, allocation of USD 100 million:
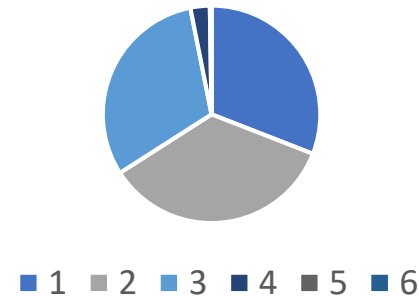
1. Equal amount of resources per person at risk – while following a principle of equality, does not take into account 'need'

2. Allocating funds in proportion to disease burden e.g. number of deaths – follows an utilitarian principle in that it will maximize benefits

3. Allocating fund to provide equal access to interventions – will provide equity as a access to choice

4. Allocating funds to the least well off (then successively according to need) (Rawlsian maximin)

Richard Cibulskis. MPAC meeting March, 2013. Financing Malaria Control – allocating limited resources.
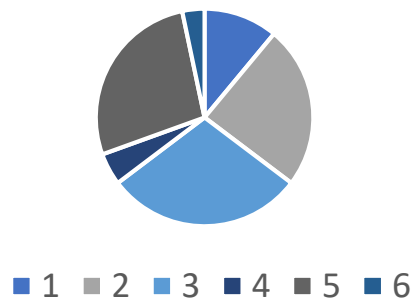http://www.who.int/malaria/mpac/resource_allocation_mpac_presentation_march_2013.pdf
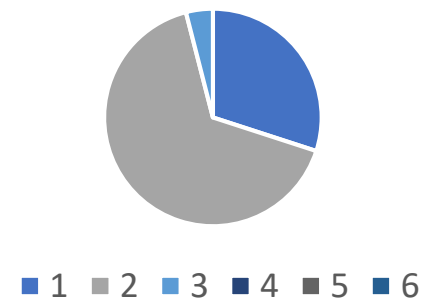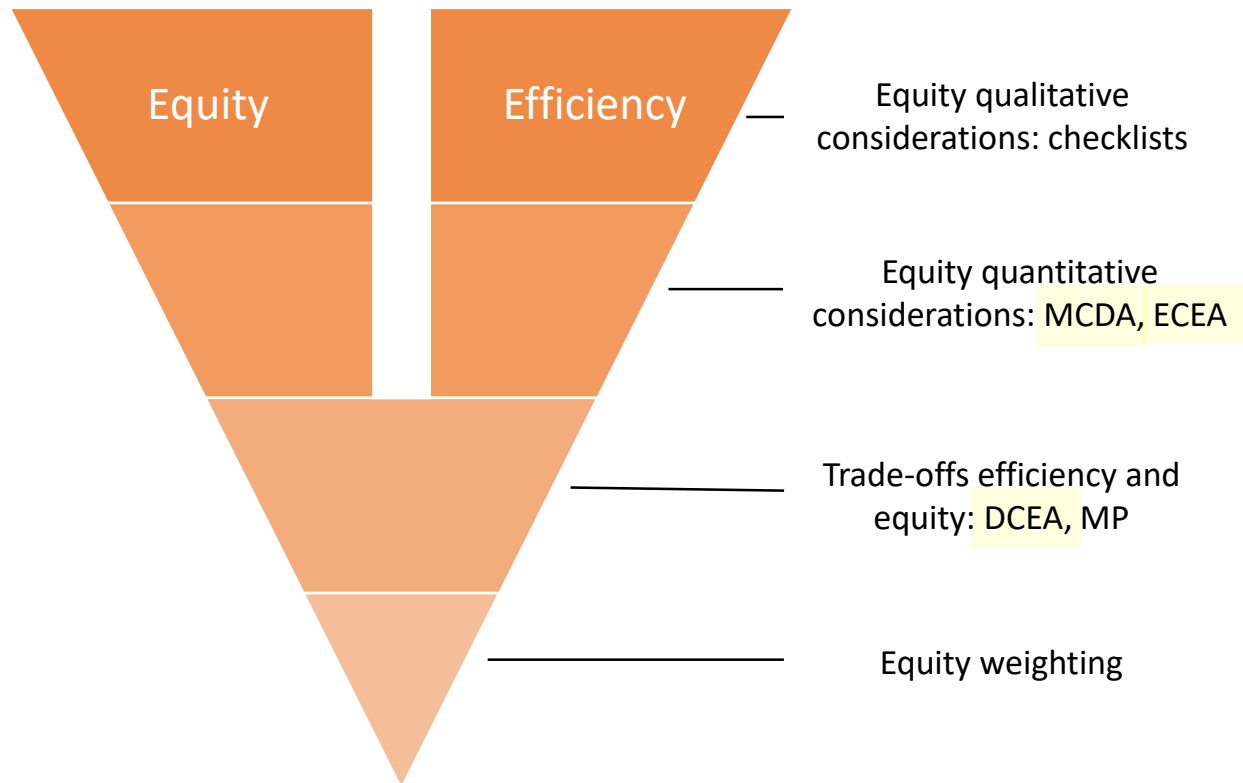
Equal amount per person
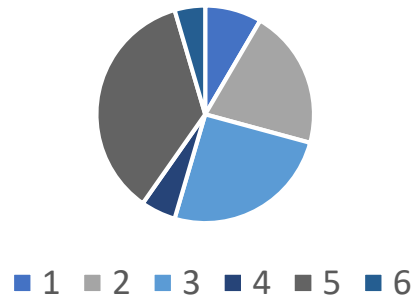
In proportion to deaths

In proportion to resource need

Until resource need fulfilled

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

Equity

Efficiency

Equity qualitative considerations: checklists

Equity quantitative considerations: MCDA, ECEA

Trade-offs efficiency and equity: DCEA, MP

Equity weighting

- Sophisticated modelling of heterogeneities in risk

- In general, aim is to maximize population health

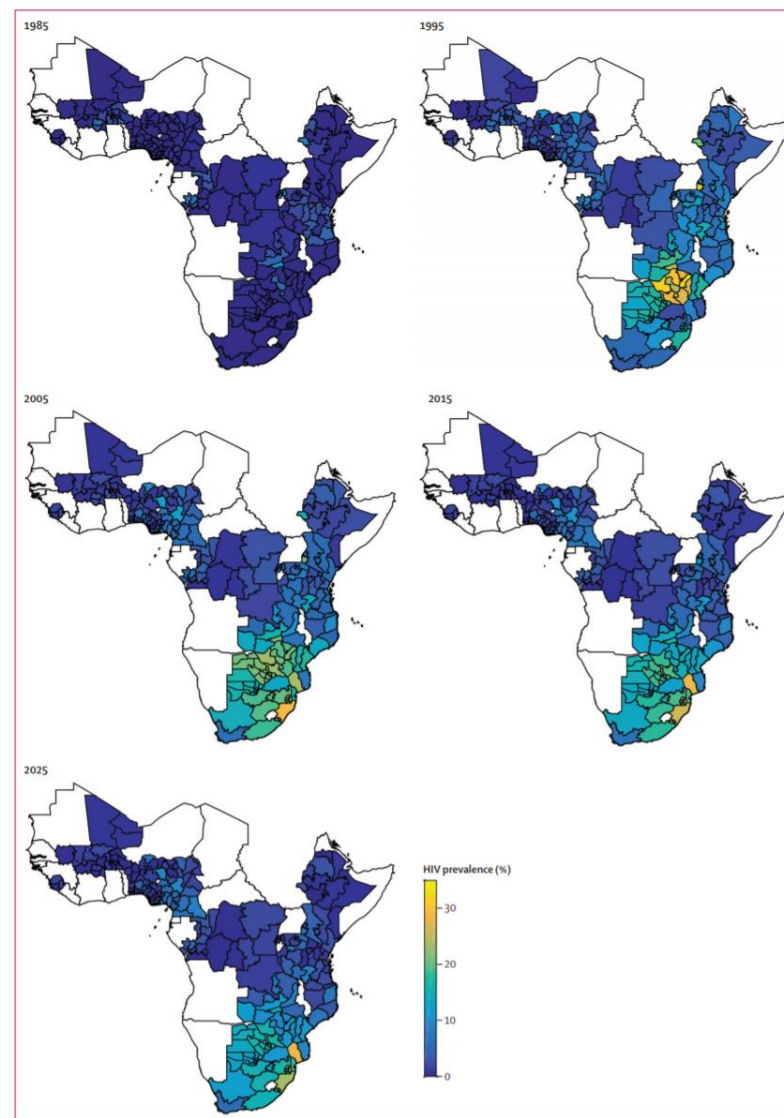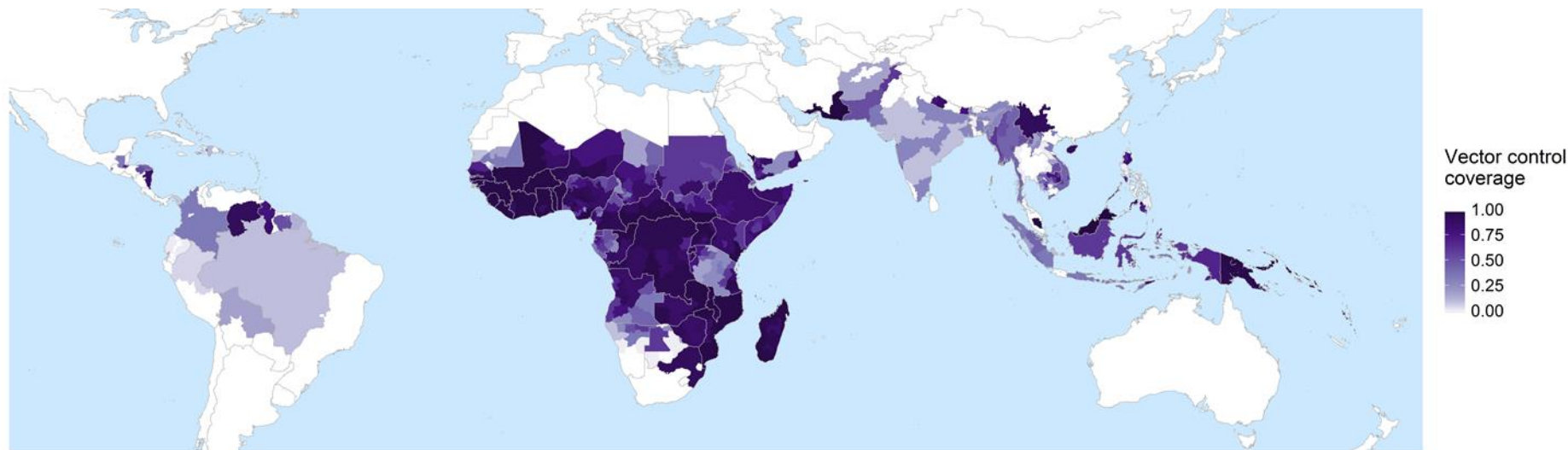- Limited work integrating equity considerations in economic evaluations

Figure 1: Modelled spatiotemporal dynamics of HIV

One possible trajectory, in 10 year increments from 1985 to 2025, produced by the model for subnational HIV prevalence among adults (ages 15-49) across sub-Saharan Africa, consistent with present estimates and past trends. Modelled countries are listed in the appendix (p 2); countries in white are not modelled. The average HIV prevalence across all modelled countries is 5·8% for 2015.

Target coverage needs to be very high in high burden countries but can be lower overall but targeted in lower transmission countries where malaria is more heterogeneous.

Approach	Application to transmission models
Qualitative comparison	These approaches do not attempt an integration with economic evaluation and can be applied in the same way to any models.
Quantitative comparison **(additional criteria)**	Use of model outputs for post-simulation accounting of health effects, costs and financial protection. It would be possible to link healthcare seeking decisions to ability-to-pay, therefore assessing impact of financial protection on indirect health effects.

Approach	Application to transmission models
Trade off equity efficiency	Algorithmic resource allocation using equity-constrained optimisation – as is currently done with budget constraints (OPTIMA) DCEA emphasizes the simultaneous assessment of multiple dimensions of equity – has not been applied to transmission models, needs additional dimensions
Equity weights	The application of differential weights to transmission model outcomes is straight forward and analogous to the weighting of outcomes from other health economic models.

- Focus scope
  - Global/country (different objectives between groups and within group of policy makers)
  - Equity relevant question – evaluation or planning
  - General modelling v ID modelling
  - Transparency, not prescription but reporting standards: uncertainty, assumptions (both conceptual and structural)

- Highlight process with stakeholder engagement: Focus on making results that are useful to policymakers by using their definitions and framework choices

- Incorporate political constraints where able to

- Identify data needs: importance, availability and limitations of data and linkage (epidemiological, demographic, economic)

- Methods development needs

What do we do next as a community: further research, case studies?

- Country/global applications
- Exploratory modelling – what are the dimensions that matter, what are the most efficient ways to include equity (characterisation of equity v number of dimensions)

Outputs

- Meeting report – circulated (to all)
- Statement – paper (draft, October)
- Chapter in Equity Handbook

Reach out to people we missed

Engagement with other communities – work with consortia (modelling and cost), iDSI (HTA process), and global funders to engage other groups and LMIC researchers