Value for money of structural interventions: going beyond HIV-only cost-effectiveness analysis

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Background

- Structural interventions tackle the social drivers of HIV, but also have other health and development primary objectives
- In the context of shrinking HIV funding and pressure for sustainable financing, structural and development interventions with multiple outcomes are an opportunity
- UNAIDS Investment Framework: HIV funding can be "*a catalyst to achieve synergies within the broader health and development programmes and to promote intelligent investment across several sectors*" (*Schwartländer et al., 2011*)
- Despite their importance, structural interventions could be undervalued and potentially underfinanced
- HIV sector is reluctant to take on such structural interventions as they are expected to have low HIV-specific cost-effectiveness and accrue more benefits to other sectors

  → Result of methodological approach, since typical value for money assessments compare the HIV value *only* to the *full* programme cost, due to the indivisibility/lumpiness of such investments

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Investment

Cash transfer scheme to keep girls in school – Zomba, Malawi

$10/month provided to in and out-of-school girls (13-22 yrs)

(Baird et al., 2010 & 2012)

Outcomes

35% reduction school drop-out rate

40% reduction early marriages

76% reduction in HSV-2 risk

58% reduction in depression risk

30% reduction in teen pregnancies

64% reduction in HIV risk

→ **Cost per HIV infection averted = $ 5,000 – 12,500**

> Cost per HIA for other interventions:
$1,315 for VCT; $857 for PMTCT;
$181 for male circumcision
(Galarraga et al., 2009)

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Premise:

- HIV resources could be used to co-finance structural interventions with other benefiting (sub-) sectors
- Value for HIV-money of structural interventions could then be assessed, based on the HIV sector's contribution

Objectives:

- To explore to what extent the HIV sector could consider co-financing structural interventions
- To analyse the consequences of various decision rules from the HIV perspective for the financing of structural interventions

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Economic evaluation methods & decision rules

Method	Outcome unit	Implications for structural interventions	Decision rule/threshold
Cost Minimisation Analysis (CMA)	n.a.	identical outcomes - ructural interventions with	Lowest cost option
Cost-Effectiveness Analysis (CEA)	Natural unit e.g. HIV infection averted	Considers variations in effectiveness between options But single outcome analysis impedes the incorporation of multiple outcomes (within HIV and beyond)	Lowest CER League tables (lowest CERs until budget spent)
Cost-Utility Analysis (CUA)	DALY QALY	Allows for HIV-wide and health sector wide comparisons But single health outcome makes take non-health outcomes into a	Lower CERs League tables Below $25-150/DALY averted Below 1x or 3xGDP/cap per DALY averted
Cost-Benefit Analysis (CBA)	Monetised outcome ($)	Benefits from all sectors can be accounted for and monetised	Every option where B>C (or BCR>1)
Cost-Consequence Analysis (CCA)	Multiple natural units	Used to present multiple outcomes, where CBA is not feasible Does not combine measures of benefit into a single measure so cannot be used to rank	No rule

BUT the HIV sector thinks in terms of CEA outcomes

Preferred

Proposed HIV Willingness to Pay thresholds for co-financing

At most…

- Worth funding structural interventions up to the point at which they are considered HIV cost-effective (and affordable)
- Equal to WHO's threshold of GDP per capita per HIV DALY averted

$$\frac{\text{GDP/cap}}{\text{Cost/DALY}} \times \text{Total Costs}$$

At least…

- Residual programme costs that would not be funded by other sectors, but would correspond CER < GDP/capita threshold

$$\text{Total Costs} - \sum \text{WTP}_{\text{other sectors}}$$

Its Fair Share…

- Another approach is to apportion the total programme benefits between (sub-) sectors based on CBA and then HIV paying its share
- Provided that BCR > 1 and HIV contribution < WHO threshold

$$\frac{\text{Benefits}_{\text{HIV}}}{\text{Total Benefits}} \times \text{Total Costs}$$

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Methods (CEA threshold approach)

- CEA calculations:
  - Absolute impact from the trial was calculated based on published figures in the natural units of interest to each sector
  - Based on the DALY formula and/or DCP2 estimates of DALYs per health outcome, we estimated total DALYs averted
  - Maximum WTP for each health outcome = total DALYs averted x GDP per capita
  - Maximum WTP for education outcomes = total impact x highest CER in literature

- Sensitivity analyses:
  - Varied total programme costs based on actual trial costs and estimated costs at scale
  - Varied WTP for health outcomes to WHO CE threshold of 3x GDP per capita
  - Varied WTP for education outcomes to lowest CERs in the literature

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Methods (CBA apportionment)

- Modelling adopted for RethinkHIV analysis:
  - Coverage: 100% of girls currently in secondary school living on less than $1.25 a day (constrained by existing coverage)
  - Unit costs: estimated from Zomba trial published data and simplified (conservative) assumption of no scale effect
  - HIV impact modelled using estimates of impact on HIV incidence among direct beneficiaries (64% reduction)
  - DALYs estimated using standard formulae
  - Incremental cost per DALY averted includes cost savings and life expectancies adjusted for ART (modelled on current levels of ART coverage)
  - Other benefits modelled = higher earnings, reduced child mortality *(King et al., 2007)*

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Results: CEA thresholds

(Sub-) Sector	Outcome	Total Zomba impact	Total DALYs averted	Threshold per unit of outcome (US$)	Funding (US$)	Share of programme costs	
						At Scale ($110,250)	Trial phase ($275,625)
HIV	HIV infections averted	5.5	83	Min: 303	25,050	**0%**	**9%**
				Max: 327	27,055	**25%**	**10%**
Education	Drop-outs averted	24	n.a.	535	128,730	117%	47%
	Drop-outs re-enrolled	193		79	15,208	14%	6%
	School attendance (additional years)	144		303	58,537	53%	21%
	English test scores (0.1 SD gains)	708		5.4	3,807	3%	1%
Sexual & Reproduc-tive Health	HSV-2 infections averted	15.6	78	327	25,483	23%	9%
	Teen pregnancies averted	9.8	38	327	12,399	11%	5%
Mental Health	Cases of depression averted	45.8	19.6	327	6,410	6%	2%
All sectors		Silo budgeting (highest sector WTP)			206,283	Funded	Not funded
		Co-financing (total WTP)			277,631	Funded	Funded

Results: CBA apportionment

	National scale 5-year programme
HIV benefits (US$)	75 million
Share of total benefits	44%
HIV costs (US$)	16.8 million
HIV DALYs averted	14,550

	US$
HIV-only Cost per HIV DALY averted	996
GDP per capita	327
3 x GDP per capita	981

- In Malawi, national scale programme has benefit-cost ratio of 2.9
- If the HIV sector were to fund only its share of benefits, the cost per HIV DALY averted would go from $ 2,464 to $ 996, but would still be above WHO's cost-effectiveness thresholds → not HIV cost-effective

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Affordability in Malawi

(Sub-) Sector	National scale (million US$)	National sector budget (million US$) 2011/12	Donor disbursements (million US$) 2010/11	Average size of donor projects (million US$) 2010/11
HIV	0.7	78	298.2	2.6
Health	1.3	222		
Education	6.0	312	167.7	4.1
Total	8.0 (national programme)	1,980 *(national budget)*	1,022 *(overall)*	2.3 *(overall)*

Based on national sector budget and donor disbursements in 2010/11, the relative contributions for a national-scale scheme appear quite affordable, even assuming trial costs.

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Conclusion

- With silo approach, certain structural interventions with potential could be underfinanced or go unfunded
- Co-financing provides an opportunity to realise development synergies, but will require multi-sectoral coordination/negotiation mechanisms
- Cost-effectiveness is but one criterion in resource allocation, which is a political process – other considerations include equity, acceptability, affordability, foregone programmes, etc.
- Nonetheless, only considering HIV outcomes in the economic evaluation of structural interventions would provide incomplete evidence for policy-makers and could lead to undesirable decisions from an HIV and societal perspective

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Thank you

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http://strive.lshtm.ac.uk/

Presentation also available at http://same.lshtm.ac.uk/

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