

Costs of scaling-up STI treatment interventions: A systematic review and cost projections of different service delivery modes and treatment strategies

Fern Terris-Prestholt, Seema Vyas, Lilani Kumaranayake, Philippe Mayaud, Charlotte Watts

¹ London School of Hygiene & Tropical Medicine, UK



Background

- Globally it is estimated that 340 million new cases of curable sexually transmitted infections (STIs) occur annually among sexually active men and women.
- With the growing recognition of the burden of STIs, and evidence of the links between STIs and HIV transmission, there have been calls to increase levels of investment in the provision of STI treatment and prevention services.
- Information on the costs of providing different types of services can make an important contribution to discussions about the relative efficiency and equity of projects.
- This poster presents some of the main findings from a systematic review of the unit costs of STI treatment in low- and middle- income countries and uses this to explore key factors influencing unit costs and scaling up

Methods

- Following an extensive PubMed search supplemented by reviews of grey literature, 53 primary studies were identified.

4798	Articles or abstracts identified initially
↓ 180	Removal of duplicates or no author
4618	
↓ 1168	Removal of articles with no reference to cost in title or abstract
3450	
↓ 98	Removal of articles focusing on laboratory aspects of diagnosis
3352	
↓ 3146	Removal of articles whose abstracts or titles focused on industrialized countries and/or not STI
306	
↓ 117	Removal of articles that do not present costs or cost-effectiveness data in abstracts
89	
↓ 8	Removal of articles not presenting impact measures for treatable STI
81	
↓ 28	Removal of non-original cost studies and one non-English paper
53	
- Costs were analysed by pathogen and syndrome, and by outcome measure.
- Regression analysis was used to estimate the impact of service delivery mode and syndromic management on unit costs, adjusting for costing method.

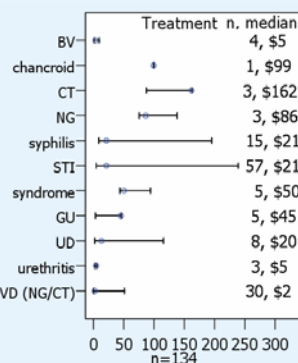
Search Results

- Just over 1/3 of the studies had been undertaken in 2000 or later and most were from Africa. Non-African studies were from Bangladesh, Bulgaria, Cambodia, China, India, Indonesia, Nicaragua, Peru, Russia and Thailand.
- Over half presented empirical cost data (58%), 34% economic costs, and 17% full costs.
- Most studies (42/53) concentrated on costing service provision interventions of which 18 were STI interventions provided to people presenting at service providers, 17 included patient screening and 7 included a form of outreach.
- The remaining 11 studies focussed on presenting drug costs only (4), patient expenditures (5), provider profits (1), and tracing defaulter patients and partners (1).

Summary of cost studies

Studies (N=53)	% of studies
Undertaken after 2000	34%
Undertaken in sub Saharan Africa	64%
Presenting empirical costs	58%
Presenting economic costs	34%
Presenting full costs	17%
Costing service provision interventions	79%

Unit costs



- The 53 studies provided 117 observations of the drugs costs for treating STI and 134 observations of the cost per STI treatment costs which includes the cost of providing the service.
- Variation in treatment costs was 10 times greater than variation in drug costs, reflecting differences in costing methodologies and service delivery.
- The median cost for drugs only was \$2.62, ranging from \$0.05 to \$35.23 and for treatment was \$17.80, ranging from \$0.45 to \$238.81.
- Studies reported outcomes for 20 different outcomes, from cost per person reached (median \$0.44) to cost per HIV infection averted (median \$2,229).

Regression results

- Outreach services had significantly higher costs relative to clinic serving symptomatic patients, and syndromic management had significantly lower costs relative to other management approaches.
- Unit costs in Africa were 3.34 ($e^{1.205} = 3.34$) times costs of interventions elsewhere.
- Cost per case cured was twice as high ($e^{0.723} = 2.06$) as cost per treatment.
- Scale was negative and significant i.e. the more people/STI treated and/or cured, the lower the unit cost.

Key Determinants of Unit Costs and Predictions by Regression Analysis (dependent variable: Ln [unit costs])

Variable	Coefficients	Multiplication factor ($e^{\text{coefficient}}$)
Constant ‡	-47.910	
Costing method:		
ECONOMIC (relative to Financial)	0.324	1.38
FULL (relative to Incremental)	1.252**	3.50
Location:		
AFRICA (relative to rest-of-world)	1.205**	3.34
Impact measure: (relative to per treatment)		
EFFECTIVENESS (e.g. per STI cured, etc)	0.723**	2.06
Service delivery mode: (relative to clinic serving symptomatic patients)		
SCREENING	0.432	1.5
OUTREACH	0.415*	1.51
Protocol:		
SYNDROMIC MANAGEMENT (relative to other management strategies)	-0.705*	0.49
YEAR	0.025	1.03
Ln(SCALE)	-0.142**	0.87
PCGDP	-0.000	1.00

n=131; Adjusted R² 0.72 * p-value ≤ 0.1 ** p-value ≤ .01

Exploratory Projections

- The model predicts that the full economic costs per person treated in a clinic serving 1000 symptomatic patients using syndromic management in 2001 in an African country with a per capita income of \$600 would be: \$54 per patient.
- Predicted unit costs by variations to the scenario above are:
 - Incremental cost: \$16 per patient.
 - Outside of Africa: \$16 per patient.
 - Per STI cured: \$112.
 - 100 patients: \$75; 10,000 patients: \$39 per patient.
 - Outreach treatment intervention: \$82 per patient.
 - Not syndromic management: \$110 per patient.

Conclusions

- This study has systematically summarised the evidence on the costs of STI treatment interventions in developing countries.
- Due to the variety of aims for collecting cost data in the studies, there is a lack cost estimates using comparable methodologies which is needed to estimate the cost of scaling up.
- The analysis of empirical costs estimates suggests that unit costs will decrease as projects grow. However, these precise predictions above should be seen as indicative rather than firmly predictive. It also highlights the important impact of different costing methodologies and service delivery modes on unit costs.
- Further refinement of such models, by including additional observations and further details of study settings (such as STI prevalence, etc.), can contribute towards evidence based projections of the costs of scaling-up STI treatment services.

→ Forthcoming in **October 2006 STD special issue on the economics of STI 'The Costs of Treating Curable Sexually Transmitted Infections in Low- and Middle-Income Countries: A systematic review'.**

Author contacts: Fern.Terris-Prestholt@lshtm.ac.uk; Seema.Vyas@lshtm.ac.uk