

Economics

Review: the cost-effectiveness of interventions for HIV/AIDS in Africa varies greatly

Creese A, Floyd K, Alban A, et al. *Cost-effectiveness of HIV/AIDS interventions in Africa: a systematic review of the evidence. Lancet* 2002;**359**:1635–42.

QUESTION: What is the cost effectiveness of HIV/AIDS interventions in Africa?

Data sources

Studies were identified by searching Medline, Popline, and EconLit (all from 1984–2000). Bibliographies of relevant articles were reviewed and experts in HIV/AIDS research contacted for unpublished studies.

Study selection

Studies were selected if they reported data for Africa, measured both cost and effectiveness, used standard methods for estimating costs and outcomes, included all

major cost items, and allowed a generic measure of outcome (either HIV infections prevented or disability adjusted life years [DALYs] gained) to be calculated. Studies were excluded if the regimen was now out of date, drug prices had changed substantially, or the effectiveness of the intervention had been estimated before the results of clinical trials. Interventions not covered by the initial study selection criteria were included if some cost and effectiveness data existed or the drug costs were available.

Data extraction

Data were extracted on year and country of the study, details of the intervention, year of prices, discount rate, costs included, costing methods, main assumptions, and effectiveness. For all studies, unit costs and effectiveness were calculated and standardized. After the standardization, 2 measures of cost effectiveness were calculated: cost per HIV infection averted (for the preventive measures) and cost per DALY gained (for all interventions).

Main results

24 studies met the selection criteria. Intervention groups for prevention or treatment and care of HIV/AIDS assessed with the corresponding standardised estimates of the cost in 2000 US dollars per HIV infection prevented and per DALY gained are in the table.

Conclusion

In Africa, the cost per HIV infection prevented and per disability adjusted life year gained varies greatly with the method of intervention for prevention or treatment and care of patients with HIV/AIDS.

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no external funding.

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Standardised cost effectiveness (cost in 2000 US dollars) estimates for HIV/AIDS intervention methods in Africa*

Intervention group	Cost per HIV infection prevented (range)	Cost per disability adjusted life year gained (range)
Condom distribution	11–2188	1–99
Blood safety measures	18–950	1–43
Peer education for prostitutes	79–160	4–7
Prevention of mother to child transmission	20–21 355	1–731
Diagnosis and treatment of STDs	271	12
Voluntary counselling and testing	393–482	18–22
Short course treatment for PPRNSS	N/A	2–68
Co-trimoxazole prophylaxis	N/A	6
Home based care	N/A	77–1230
Preventive treatment for tuberculosis	N/A	169–288
Antiretroviral treatment for adults	N/A	1100–1800

*STDs = sexually transmitted diseases; PPRNSS = patients with positive results on a new sputum smear; N/A = not available.

COMMENTARY

In a finite world, with finite budgets, there are never enough resources to enable the adoption of all available health interventions even when their effectiveness has been unequivocally established. Hence, one enters the realm of “affordability,” which is dependent on the overall wealth of the society under consideration. Cost effectiveness analysis, when combined with simple techniques of mathematical optimisation, offers an algorithm for the rational, efficient, and consistent allocation of a fixed budget. A careful application of this algorithm for mutually exclusive interventions leads one to the decision rule: “order interventions according to their incremental cost effectiveness ratios”. Start from the top of the list with the most cost effective intervention first, and then go down the list of cost effectiveness ratios, funding each successive project until the available funds are exhausted. This process will result in society gaining the maximum number of benefit units, usually measured as life years of health gained after adjusting for quality of life.

In this review, Creese *et al* focus on the cost effectiveness of HIV/AIDS interventions and make a convincing case for funding several interventions, especially prevention programmes, based on their very favourable cost effectiveness ratios. They use a systematic review approach to standardise the results of various studies from diverse settings, applicable to differing demographic and risk groups. Standardisation leads to all costs being presented in US dollars and outcomes as DALYs.

Two methodological limitations need to be highlighted. Firstly, standardising costs from studies done in different countries is problematic because the real cost of inputs that are used in producing health are dependent on technological parameters, wage rates, and capital costs in each country such that a simple exchange rate conversion can be misleading. Secondly, there are several sources of measurement error that could lead to uncertainty in the estimate of the cost effectiveness ratio, which cannot be resolved using standard statistical techniques. One may try to refine economic systematic reviews according to the above criteria, but ultimately we are still dealing with a model, albeit of a more complex construct.

How are we to address the real and present needs of people in Africa whose lives are being devastated by HIV/AIDS? According to Creese *et al*, we must recognise that prevention of HIV/AIDS in Africa can be cost effective and incorporate cost effectiveness data into the planning of HIV/AIDS prevention programmes. Despite the noted limitations, overall I fully concur with the preceding recommendation.

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