Assessing efficiency and costs of scaling up HIV treatment
Cleary SM, McIntyre D, Boulle AM

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study examined the cost-effectiveness of human immunodeficiency virus treatments focusing on their efficiency and the costs of increasing treatment levels. No antiretroviral therapy (ART) was compared with first-line or first- and second-line ART. With a budget of $8 billion over 10 years, the most efficient strategy to maximise benefits was to place three-quarters of eligible patients on first-line ART. The study used appropriate methodology and the results were satisfactorily reported. The authors’ conclusions appear to be valid.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to examine the cost-effectiveness of three interventions for patients with human immunodeficiency virus (HIV). The study focused specifically on issues such as the treatment efficiency and the costs of increasing treatment to target levels.

Interventions
The three strategies were the treatment and prophylaxis of opportunistic and HIV-related illnesses: without antiretroviral therapy (ART); with first-line ART only; and with both first- and second-line ART.

Location/setting
South Africa/primary care (HIV clinic).

Methods
Analytical approach:
The analysis was based on a Markov model simulation with a lifetime horizon. The authors stated that it was carried out from the perspective of the public health sector.

Effectiveness data:
Most of the clinical data came from the long-term follow-up of a cohort of adult HIV-positive patients receiving care in a poor setting in South Africa. The sample was enrolled in Khayelitsha (on the outskirts of Cape Town) and included 11,729 patients, with 1,146 no-ART patient-years and 2,229 ART patient-years of follow-up over a median follow-up period of 0.63 years for no-ART and 1.03 years for ART. These data were supplemented with evidence from the Cape Town AIDS Cohort, a local natural history cohort of 981 patients not receiving ART. The key clinical endpoint was the treatment effect in terms of survival.

Monetary benefit and utility valuations:
The utility values were derived from a subsample of patients in the Khayelitsha cohort study. The European Quality of life (EQ-5D) questionnaire was used and data were converted to tariffs using the time trade-off values from the UK general population.

Measure of benefit:
Quality-adjusted life-years (QALYs) and life-years (LYs) were the summary benefit measures. Future benefits were discounted, but the rate was not reported.

Cost data:
The economic analysis included the costs of clinic visits, in-patient care, tuberculosis treatment, and ART. These costs were not broken down into individual items. Most of the data on resource use and costs came from the Khayelitsha cohort. The costs of antiretroviral drugs were based on official list prices. All costs were in US dollars ($) and the price year was 2003. Future costs were discounted, but the rate was not reported.

Analysis of uncertainty:
First- and second-order Monte Carlo simulations were carried out on all the model inputs to generate confidence intervals (CIs) around the costs, benefits, and cost-effectiveness and cost-utility ratios.

Results
The discounted lifetime costs were $2,743 with no-ART, $5,779 with first-line ART, and $9,435 with first- and second-line ART. The discounted LYs were 2.7 with no-ART, 6.9 with first-line ART, and 9.5 with first- and second-line ART. The discounted QALYs were 1.9 with no-ART, 5.7 with first-line ART, and 8.0 with first- and second-line ART.

The incremental cost per LY gained was $723 (95% CI 652 to 846) with first-line ART versus no-ART and $1,365 (95% CI 1,344 to 1,398) with first- and second-line ART versus first-line ART. The incremental cost per QALY gained was $795 (95% CI 706 to 911) with first-line ART versus no-ART and $1,625 (95% CI 1,601 to 1,665) with first- and second-line ART versus first-line ART.

The efficiency analysis indicated that the efficiency of either ART strategy depended on the HIV treatment budget. With a budget lower than $10 billion during the 10-year planning period, first-line ART was the most efficient strategy, while a combination of both first-line only and first- and second-line ART was most efficient when the budget was between $10 and $12 billion. With a budget over $13 billion, the first- and second-line ART for all patients was most efficient.

Authors’ conclusions
The authors concluded that the HIV treatment budget was a key issue when deciding which intervention to implement. With a budget of $8 billion over a 10-year planning period, the most efficient strategy was to place three-quarters of eligible patients on first-line ART to maximise the treatment benefits.

CRD commentary
Interventions:
The comparators were appropriately selected and may be relevant to other health care settings with similar characteristics.

Effectiveness/benefits:
The use of a cohort study to derive the clinical data was appropriate as its sample was representative of the patient population in the study setting. Some key details of the main source of evidence were provided and more information was available in the primary publication. Supplementary data were obtained from another cohort study, which was carried out in the same setting. Caution may be required when applying these clinical data to other populations of HIV patients. These longitudinal studies could have methodological limitations due to their non-randomised nature. Both benefit measures were appropriate for capturing the impact of the interventions on patients’ health. The use of discounting was appropriate, but the rate was not clearly reported. Both LYs and QALYs allow cross-disease comparisons to be made.

Costs:
Limited information on the cost analysis was provided. The data were mainly derived from the Khayelitsha cohort study, but a cost breakdown was not reported and the cost items were not listed. Each patient in the cohort study was used as their own control, with the pre-ART period being used to calculate the no-ART resource use. The price year was given, which allows reflation exercises to be carried out in other time periods. Discounting was appropriate, but the rate was not reported.
The analytical approach used to synthesise the costs and benefits was appropriate. Both discounted and undiscounted results were presented. The issue of uncertainty was satisfactorily addressed by means of a probabilistic analysis. In general, the results were clearly presented and discussed. Their generalisability to other settings was explicitly discussed and the authors acknowledged the limitations of these results in their applicability to other patient populations. The main strength of the study was the addition of a population level analysis of the costs and benefits of the different strategies. This provided information on the most efficient combination of options for different budgets.

Concluding remarks:
The study was based on appropriate methodology and the results were satisfactorily reported. The authors’ conclusions appear to be valid.

Funding
Supported by a grant from the Health Systems Trust.

Bibliographic details
Cleary SM, McIntyre D, Boulle AM. Assessing efficiency and costs of scaling up HIV treatment. AIDS 2008; 22(Supplement 1): S35-S42

PubMedID
18664951

DOI
10.1097/01.aids.0000327621.24232.71

Original Paper URL
http://journals.lww.com/aidsonline/Abstract/2008/07001/Assessing__efficiency__and__costs__of__scaling__up__HIV.6.aspx

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Anti-Retroviral Agents /therapeutic use; Antiretroviral Therapy, Highly Active; Budgets; Cost-Benefit Analysis; Costs and Cost Analysis; Developing Countries; Drug Costs; HIV Infections /drug therapy /economics; HIV-1; Humans; Quality-Adjusted Life Years; South Africa

AccessionNumber
22008102458

Date bibliographic record published
31/03/2009
Date abstract record published
17/02/2010