Cost and cost-effectiveness of community-based care for tuberculosis patients in rural Uganda
Okello D, Floyd K, Adatu F, Odeke R, Gargioni G

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.

Health technology
The use of a community-based care strategy for tuberculosis (TB) patients with positive smears. This involved 2 weeks in hospital, during which the patients were given the option of community-based care or conventional hospital-based care. Patients choosing community care were assigned a public health worker who was responsible for arranging a community meeting at village level, after which a trained volunteer monitored the patient and provided directly observed treatment every day for 8 months and reminded the patient to attend a health facility at 2, 5 and 8 months. The drug regimen was 2 months of daily isoniazid, rifampicin, ethambutol and pyrazinamide, followed by a 6-month continuation phase of daily ethambutol and isoniazid (2HREZ/6HE). Sputum smears were monitored after 2, 5 and 8 months.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised new smear-positive pulmonary patients.

Setting
The setting was secondary care and community care. The economic study was carried out in Kiboga District, central Uganda.

Dates to which data relate
The effectiveness and resource use data were derived from sources dating from 1995 to 1999. The price year was 1998.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was carried out prospectively on some of the patients who provided the effectiveness data.

Study sample
No power calculations were given in either this paper or the original paper that provided the effectiveness evidence (Adatu et al. 2003, see 'Other Publications of Related Interest' below for bibliographic details). There were 329 patients
in the intervention group and 294 patients in the control group (see Adatu et al. 2003). It appears that all patients presenting within the study period have been included in the sample.

**Study design**
This was a multi-centred, non-randomised study with historical controls. The patients were followed up for 8 months after starting treatment.

**Analysis of effectiveness**
The analysis was conducted on an intention to treat basis. The primary health outcome used to evaluate the treatment strategies was the percentage of patients successfully treated. This was defined as the percentage recorded as cured plus the percentage who completed treatment but for whom cure was not confirmed by sputum microscopy. The comparability of the patient groups was not given in this paper.

**Effectiveness results**
The successful treatment rate was 56% with the conventional approach and 74% for the community-based approach.

**Clinical conclusions**
The authors concluded that the community-based approach was more effective then the conventional approach for smear-positive patients.

**Measure of benefits used in the economic analysis**
The measure of benefits used was the number of smear-positive patients successfully treated.

**Direct costs**
The direct health care costs measured were hospital day, outpatient visit, drug regimen, sputum smear, district supervision per patient, zonal supervision per patient, district health team contact per patient, situational analysis per patient, district review manual per patient, training of health worker, training of community volunteer, community mobilisation, evaluation and referral system, supervision by sub-county health workers and national supervision per patient. Travel costs borne by patients to the nearest health facility were also considered. Non-health care direct costs were also measured. These comprised patient time sacrificed to be in hospital, time taken to visit outpatient facility, time taken to visit volunteer, time taken to train the volunteer, and volunteer's time used to train patient, to motivate patient and to observe treatment. The costs were not discounted as they were incurred in less than two years. A 3% interest rate was used to derive an annualised capital cost. The quantities and the costs were analysed separately. The costs were estimated from actual data. The price year was 1998.

**Statistical analysis of costs**
No statistical analysis of the costs was carried out.

**Indirect Costs**
Productivity losses were not included in the analysis.

**Currency**
US dollars ($).

**Sensitivity analysis**
A one-way sensitivity analysis was carried out. The analysis made assumptions about the cost of a hospital day (assumed the lowest possible) and 100% bed occupancy, and only included costs that varied in proportion to patient numbers.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The cost per patient treated was $510 for conventional hospital-based care and $419 for community-based care.

Synthesis of costs and benefits
The cost per smear-positive patient successfully treated was $911 with conventional hospital-based care and $391 with community-based care. The results were not sensitive to an assumption of a much lower cost of a day in hospital.

Authors' conclusions
Community-based care for new smear-positive patients was the dominant strategy. It incurred lower costs and improved health outcomes.

CRD COMMENTARY - Selection of comparators
The choice of the comparator (i.e. hospital-based care) was justified because it was the current practice in the authors' setting before 1998. You should decide if the comparator represents current practice in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness data were derived from a single study, a non-randomised study with historical controls. As such, it has the drawbacks of that category of study design. There was insufficient information to decide whether the study sample was representative of the study population, although the reporting suggested that all presenting patients were included. No information was given on the comparability of the intervention and control groups. Although the analysis of effectiveness was handled effectively in other respects, it is likely that the internal validity of the results is quite low.

Validity of estimate of measure of benefit
The measure of benefit was obtained directly from the effectiveness analysis, but it was expressed as a percentage cure rate rather than the actual number cured.

Validity of estimate of costs
From the cost perspective adopted (i.e. that of society), not all relevant categories of cost were included. For example, the authors do not appear to have included productivity losses. Without including these costs, the statement that the perspective was societal is incorrect. The costs and the quantities were reported separately in a clear comprehensive manner. The resource use quantities were taken from a single study, while the prices were taken from the authors' setting. No other sources were used for the quantities. No statistical, sensitivity or any other kind of analysis of the quantities was conducted. A sensitivity analysis on the price of a hospital day was carried out, but no other (statistical or otherwise) analyses. The price year was reported, which will aid future reflation exercises.

Other issues
The authors compared their results with those from other studies. They also addressed the issue of generalisability to other areas of Uganda. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis. They reported several limitations to their study. For instance, the hospital might not have been able to make use of resources freed up by community care, and the time costs of volunteers might have been
overestimated. Correcting this would have strengthened the authors' conclusions. Also, there might have been other changes during the time period studied, apart from the change in treatment strategy, which caused the changes in outcomes.

Implications of the study
The authors concluded that community-based care for smear-positive patients reduced costs and improved health outcomes in Uganda, and should be adopted.

Source of funding
None stated.

Bibliographic details

PubMedID
12971657

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Community Health Services /economics /utilization; Cost-Benefit Analysis; Costs and Cost Analysis; Health Care Costs /statistics & numerical data; Humans; Rural Health Services; Tuberculosis, Pulmonary /drug therapy /economics; Uganda

AccessionNumber
22003001277

Date bibliographic record published
28/02/2006

Date abstract record published
28/02/2006