Tuberculosis control priorities defined by using cost-effectiveness and burden of disease
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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 treatment of tuberculosis (TB) with a directly observed treatment, short course (DOTS) strategy was examined.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised patients with smear positive TB.

Setting
The setting was not reported. The economic study was carried out in China.

Dates to which data relate
Some of the effectiveness evidence was derived from data relating to 1994. The dates for the other effectiveness and resource use data were not stated in the paper. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a review or synthesis of completed studies.

Modelling
A model was used to identify the clinical effectiveness of the intervention and associated resource use. The type of model was not reported. A 5-year course of treatment was modelled.

Outcomes assessed in the review
The following model input parameters were identified:

- the initial cure rate under DOTS;
- the initial cure rate under non-DOTS;
- the retreat cure rate under DOTS;
- the retreat cure rate under non-DOTS;
the multi-drug resistance cure rate under non-DOTS;
the initial death rate under DOTS;
the initial death rate under non-DOTS;
the retreat death rate under DOTS;
the retreat death rate under non-DOTS; and
the multi-drug resistance death rate under non-DOTS.

**Study designs and other criteria for inclusion in the review**
The age-specific incidence of TB was taken from a cohort study. The study designs in the other primary papers identified were not reported.

**Sources searched to identify primary studies**
Not reported.

**Criteria used to ensure the validity of primary studies**
Not reported.

**Methods used to judge relevance and validity, and for extracting data**
Not reported.

**Number of primary studies included**
Approximately 4 primary studies were included in the review.

**Methods of combining primary studies**
Not reported.

**Investigation of differences between primary studies**
Not reported.

**Results of the review**
The following model input parameters were identified:

- the initial cure rate under DOTS was 90%;
- the initial cure rate under non-DOTS was 50%;
- the retreat cure rate under DOTS was 80%;
- the retreat cure rate under non-DOTS was 50%;
- the multi-drug resistance cure rate under non-DOTS was 30%;
- the initial death rate under DOTS was 5%;
the initial death rate under non-DOTS was 10%;
the death rate after re-treatment under DOTS was 5%;
the death rate after re-treatment under non-DOTS was 10%; and
the multi-drug resistance death rate under non-DOTS was 20%.

**Measure of benefits used in the economic analysis**
The measure of health benefit used was the disability-adjusted life-years (DALYs). The paper did not report how the various health states were valued.

**Direct costs**
The paper did not give details of the direct costs included in the estimation of the total costs. Only the cost of drugs, chest X-rays, and sputum smears and cultures appear to have been assessed. Information on the source of the unit costs, the resource use data, or the dates to which the data related was not given in the paper. No price year was reported. A discount rate of 3% was applied to the total cost data.

**Statistical analysis of costs**
No statistical analysis of the cost data was reported.

**Indirect Costs**
As the paper did not identify the components that make up the total costs, it is not possible to identify whether any indirect costs were included.

**Currency**
Chinese yuan (Yuan).

**Sensitivity analysis**
A series of one-way sensitivity analyses were reported. They appear to have assessed the impact of variability in the data. The selection criteria for the ranges applied were not described.

**Estimated benefits used in the economic analysis**
The paper indicated that under DOTS treatment, a total of 2,663.75 DALYs were lost per 2,000 cases. If the disease was left to its natural course, a total of 37,667.18 DALYs per 2,000 cases were lost. The number of DALYs saved with the intervention was 35,003.43.

**Cost results**
The total cost of the DOTS intervention was Yuan 1,599,700. The total cost of leaving the disease to its natural course was not reported.

**Synthesis of costs and benefits**
The cost-effectiveness of treating TB under the DOTS strategy was Yuan 457,000 per DALY. The sensitivity analysis showed that variability in the DOTS cure rate and the discount rate altered the cost-effectiveness ratio. However, the variation in the weightings to the various age groups (to establish clinical effectiveness) was not sensitive.
Authors' conclusions
Directly observed treatment, short course (DOTS) is a cost-effective strategy for tuberculosis (TB) control.

CRD COMMENTARY - Selection of comparators
The authors did not provide a justification for their choice of the comparator. However, using the natural course of the disease represents a ‘do-nothing’ approach. You should consider how this relates to usual practice in your setting.

Validity of estimate of measure of effectiveness
The measure of clinical effectiveness used in this study was derived from a model. No details of the model design were included in the paper. There was also little information about the review used to identify model input parameters. For example, there were no details on how the results of the primary studies were combined, or on whether differences between the primary studies might impact on the results of the model.

Validity of estimate of measure of benefit
The measure of health benefit was taken from the model that provided the clinical effectiveness data. No details of how the various health states were valued were given.

Validity of estimate of costs
It is difficult to comment on the estimate of costs in this analysis, owing to the lack of information provided in the paper. No details of the individual costs, the source of the unit costs or the resource use data that comprise the total cost were included in the paper. The fact that the unit costs and resource use were not presented separately limits the generalisability of the study. Generalisability is further limited by the fact that no price year was reported. This will also prevent any future reflation exercises. Discounting was appropriately performed, as the period considered for the estimation of costs was more than 2 years.

Other issues
The authors did not compare their findings with other relevant studies, nor consider how their study could be applied to other settings. However, the lack of information on the methods used in the study prevents an accurate assessment of the study. The authors acknowledged that their study did not consider that some strains of TB might be multi-drug resistant.

Implications of the study
The authors did not make any recommendations for further research or changes to policy.

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None stated.

Bibliographic details

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Other publications of related interest
Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Child; Child, Preschool; China /epidemiology; Cohort Studies; Cost of Illness; Cost-Benefit Analysis; Disabled Persons; Forecasting; Humans; Middle Aged; Models, Biological; Quality-Adjusted Life Years; Tuberculosis /economics /epidemiology /prevention & control

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