Enhanced cost-benefit analysis of strategies for LTBI screening and INH chemoprevention in Germany
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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.

CRD summary
The aim was to compare QuantiFERON TB Gold in tube versus the tuberculin skin test (TST) in screening for latent tuberculosis infection to prevent tuberculosis. QuantiFERON alone was less costly and reduced the tuberculosis cases compared with the TST alone or with confirmatory QuantiFERON test. The analysis was satisfactorily performed, with a few limitations, mainly to the reporting of the clinical data. Assuming that these estimates were robust, the authors’ conclusions seem appropriate and are consistent with the evidence presented.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study evaluated strategies of screening for latent tuberculosis infection, with the aim of providing preventative treatment and reducing the overall rate of progression to tuberculosis (TB).

Interventions
QuantiFERON TB Gold in a tube was compared with the tuberculin skin test (TST) alone, and the TST followed by QuantiFERON for those who tested positive, in a cohort of people who had been in close contact with an infected person. Those who tested positive were treated with isoniazid to prevent TB.

Location/setting
Germany/secondary care.

Methods
Analytical approach:
The authors constructed a decision tree model to estimate the economic value of the three screening strategies. The time horizon was two years after infection. The authors stated that the perspective was societal.

Effectiveness data:
The effectiveness data came from a number of published sources. The main clinical parameters were the predictive value of the tests and the toxicity of isoniazid. Other model inputs included the probability of starting treatment, the probability of isoniazid-induced hepatitis, the reduction in TB after nine or three months of isoniazid, the hospitalisation rates, and the disease progression rates.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
No summary measure of benefit was derived.

Cost data:
The costs were those to society, such as absenteeism, and to the third-party payer, such as the tests, general practitioner visits, treatment, and referrals to specialists. The cost data were a combination of epidemiological data from published literature, and costs from national databases, including the German Rote Liste and Einheitlicher Bewertungmassstab.
The costs were presented in 2008 Euros (EUR).

Analysis of uncertainty:
The authors undertook both deterministic and probabilistic sensitivity analyses and the results were described in the text and reported in tables.

Results
With QuantiFERON screening 5.1 cases of TB occurred without prevention and 2.1 cases occurred with prevention and without hepatitis and were treated with a full course of isoniazid, making 7.2 cases in total.

With TST screening 4.03 cases of TB occurred without prevention and 1.67 cases occurred with prevention and without hepatitis. There were 0.43 cases due to unread TST results, with no chance of prevention, 1.645 cases due to false-negative TST results, and 0.0865 cases due to unread false-negative results. This created 7.87 cases in total.

Screening and treatment was estimated to cost EUR 216 per close contact with QuantiFERON, compared with EUR 233 with the TST, and EUR 228 with the TST then QuantiFERON, making QuantiFERON the cheapest option.

The cost saving per 1,000 close contacts was EUR 16,800 with QuantiFERON, compared with the TST alone, and EUR 4,700 with the TST then QuantiFERON, compared with the TST alone.

The results appeared to be robust to variations in the key model parameters.

Authors' conclusions
The authors concluded that QuantiFERON alone was less costly and reduced the number of TB cases more than the TST alone and the TST with confirmatory QuantiFERON test.

CRD commentary
Interventions:
The interventions were described, but the cohort of close contacts was not well described. The analysis reflected German guidelines and appears to have included the usual practice.

Effectiveness/benefits:
The effectiveness data were from a number of published studies. The authors did not describe the method used to identify the relevant studies and it is unclear whether the best available evidence was used. They did not provide sufficient information on the source studies, but their references were given. The main focus of the paper was the costing, but the clinical estimates affect the costs, so it is important that these were from high-quality robust sources, and insufficient information was given to make this assessment.

Costs:
The perspective was clearly defined and it appears that all the relevant costs were considered. Some costs appear to have been attributed to the incorrect part of the perspective. The estimated resource use and sources for the costs were provided, making it possible to replicate the results for other settings. The price year was provided and the currency was clearly stated. The reason for not discounting the costs was provided. The costing was the main focus of the paper and it was well presented and seems to have been well conducted.

Analysis and results:
The decision analysis model was appropriate for estimating the costs and benefits of the screening strategies to explore their cost-savings. The uncertainty was appropriately assessed in probabilistic sensitivity analysis, which allowed a comprehensive assessment of the joint impact of multiple parameter uncertainty on the results. The results of the base-case, secondary, and sensitivity analyses were satisfactorily reported.

Concluding remarks:
This analysis was satisfactorily performed, but there were a few limitations, mainly to the reporting of the clinical data. Assuming that these clinical estimates were robust, the authors' conclusions appear to be appropriate and are consistent
with the evidence presented.

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