

Cost-effectiveness, affordability and feasibility of TB molecular diagnostics case of Xpert MTB/RIF

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TB molecular diagnostics: a call to action

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Overview

- Background
- Benefits of molecular tests
- Why cost and cost-effectiveness analysis?
- Cost- effectiveness evidence
- Key messages

Background

- As countries intensify TB control towards the End TB goal, they are confronted with questions of what works best in case finding and diagnosis, and at what cost
- Rapid diagnosis of TB is crucial to allow the rapid introduction of an efficient treatment, to take adequate isolation precautions and to achieve contact tracing.
- Improved diagnosis of new cases, testing for regimen eligibility and treatment monitoring need regular adaptation of diagnostic algorithms

Benefits of molecular tests

- Rapid diagnosis (few hours) compared to days and weeks for smear-culture algorithm
 - In both low and high TB prevalence areas
- Rapid results can result in prompt treatment initiation and isolation of patients, prevention of transmission, reduced hospital stay and clinic visits, and better targeted contact investigations.
 - Potentially cost saving and cost-effective
- High sensitivity and high specificity compare to smear microscopy and culture (Cochrane review, 2013)
- Xpert and early diagnosis of drug-resistant disease,
 - improvement in the early treatment and control of drug-resistant TB.

Why cost and cost-effectiveness analysis is important?

- Evidence on cost, cost-effectiveness and affordability are important for decision makers
 - Is there an additional cost?
 - How much is the additional cost?
 - Is the health gain worth the additional cost?
 - Is the cost saving worth the health loss?
- Is incorporating Xpert into TB diagnostic algorithms cost-effective compared to sputum microscopy and culture ?

Cost- effectiveness evidence

- Conditional programmatic recommendation of Xpert MTB/RIF from WHO in 2010
- Many model-based CEA predicted that Xpert would be cost-effective, either through a reduction in tuberculosis-related mortality or reduction in the overtreatment, or both, in a wide range of settings.
- However, concerns over cost-effectiveness remained and the WHO guideline recommendation was conditional explicitly acknowledging potential resource implications.
 - Context specific, quality of evidence, feasibility, implementation constraints, thresholds for cost effectiveness and affordability

Cost- effectiveness evidence

But empirical data: XTEND, NEAT trials in South Africa

- No effect on outcomes
- Not cost-effective
- Implementation constraints not the performance of technology itself
- Doesn't mean not cost effective other settings

Cost-effectiveness of Xpert MTB/RIF for tuberculosis diagnosis in South Africa: a real-world cost analysis and economic evaluation



Anna Vassall, Mariana Siapka, Nicola Foster, Lucy Cunnamo, Lebogang Ramma, Katherine Fielding, Kerrigan McCarthy, Gavin Churchyard, Alison Grant, Edina Sinanovic



Summary

Background In 2010 a new diagnostic test for tuberculosis, Xpert MTB/RIF, received a conditional programmatic recommendation from WHO. Several model-based economic evaluations predicted that Xpert would be cost-effective across sub-Saharan Africa. We investigated the cost-effectiveness of Xpert in the real world during national roll-out in South Africa.

Methods For this real-world cost analysis and economic evaluation, we applied extensive primary cost and patient

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TB Centre (Prof A Vassall PhD,
Prof K Fielding PhD,
Prof G Churchyard PhD,
Prof A Grant PhD) and
Department of Global Health

2016

Xpert MTB/RIF may be used rather than conventional microscopy and culture as the initial diagnostic test in all **adults** with signs and symptoms of tuberculosis (**conditional recommendation** acknowledging resource implications, high-quality evidence).

Xpert MTB/RIF may be used rather than conventional microscopy and culture as the initial diagnostic test in all **children** suspected of having TB (**conditional recommendation** acknowledging resource implications, very low-quality evidence).

Xpert MTB/RIF assay for the diagnosis of TB

Meeting Report

Key messages

- Cost-effectiveness highly affected by context
 - Deployment capacity, the performance of current (standard) diagnostic algorithms, cost of treatment regimens for TB and MDR-TB, the mode of implementation (including site/volume and infrastructure considerations), and the modeling approach used to assess cost-effectiveness.

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Comparing laboratory costs of smear/culture and Xpert® MTB/RIF-based tuberculosis diagnostic algorithms

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Research

The hidden costs of installing xpert machines in a tuberculosis high-burden country: experiences from Nigeria

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Key messages

- Future investments in diagnostics (and the analysis) should explicitly reflect uncertainty (and the additional costs) of implementation constraints, the tuberculosis care cascade, and the availability of complementary interventions.
- Other considerations: health equity, acceptability, feasibility

Main references

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Thank you for your attention

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