**UCL Institute for Global Health** 

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

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The UCL Centre for Global Health Economics

TB molecular diagnostics: a call to action 15<sup>th</sup> June 2018



## **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 tuberculosisrelated 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 Cunnama, 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.



Lancet Glob Health 2017; 5: e710–19

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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

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



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). 2016

#### Xpert MTB/RIF assay for the diagnosis of TB

#### Meeting Report





## Key messages

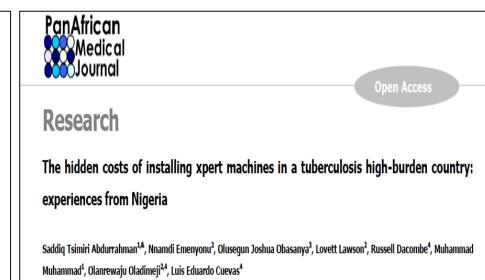
- Cost-effectiveness highly affected by context
  - Deployment capacity, the performance of current (standard) diagnostic algorithms, cost of treatment regimens for TB and MDR-TB, the mode of implementation (including site/volume and infrastructure considerations), and the modeling approach used to assess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

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

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## 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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