

CASE STUDY

Xpert on stool to diagnose tuberculosis in children is cost-effective in Ethiopia and Indonesia: a model-based cost-effectiveness analysis



WHY DID WE DO IT?

In contrast to sputum, stool is a sample that can be easily obtained from children with presumptive TB at the primary healthcare (PHC) level. Stool can be tested with Xpert MTB/Rif using a simple stool processing method. We estimated the impact of implementing stool Xpert testing for diagnosing pulmonary TB among children at the primary healthcare level on rates of bacteriological confirmation of TB and mortality among children, health system costs, and incremental cost-effectiveness, focusing on Ethiopia and Indonesia. Stool Xpert testing increased the sensitivity of TB diagnosis by 19-25% leading to a 14-20% relative reduction in mortality among children with presumptive TB. Referral up halved while treatment initiation increased by 18-25% with more children initiating treatment at PHC level. Costs increased, resulting in incremental cost-effectiveness ratios of \$132/DALY averted in Ethiopia and \$94/DALY averted in Indonesia.

WHO

Edine Tiemersma[†] ✉ edine.tiemersma@kncvtbc.org,
Pete Dodd*, Nyashadzaisho Mafirukureva*, Eveline
Klinkenberg[#], Debebe Shaweno*, Jens Levy[†], Petra
de Haas[†] and Ineke Spruijt[†]

WHERE

[†]KNCV Tuberculosis Foundation, The Hague, The Netherlands

*University of Sheffield, UK

[#] independent consultant, The Netherlands

WHEN

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WHAT

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HOW DID WE DO IT?

With local TB experts and based on national guidelines, we developed a conceptual model of care pathways for children with presumptive TB including referral between healthcare levels. The parameters determining the probability of children to follow different pathways through the tree were informed by ongoing studies, published literature, and expert opinion. The latter was obtained from local (paediatric) TB experts in an iterative process using a questionnaire and remote workshops. Lastly, the model and its outcomes were discussed in a broad stakeholder meeting involving NTP, local TB scientists and paediatricians, and other stakeholders working in childhood TB, to assess how well the model outputs fitted the local situation as well as the programmatic impact of model outcomes for the country.

SO WHAT?

As since January 2020, the WHO recommends Xpert stool testing for the diagnosis of TB in children, the NTPs of Ethiopia and Indonesia had already updated their policies. However, they considered the model outcomes useful as these provided insight in the costs and effectiveness of implementing the Xpert stool test at all levels of the health care system. They perceived the insight in reduction of referrals up as most useful.

WHAT DID WE LEARN?

The model outcomes verified the NTPs' approach to implement stool Xpert testing for children with presumptive TB. Some of our model's inputs and outputs were difficult to understand for NTP representatives, requiring further explanation. The main concerns of NTPs were related to the logistics and costs of Xpert testing (availability of calibrated modules, shelf life and costs of cartridges), rather than effectiveness.