

New tuberculosis blood test in children is reliable and highly specific

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M. tuberculosis bacterial colonies. Credit: Centers for Disease Control and Prevention.

A new blood test provides a fast and accurate tool to diagnose tuberculosis in children, a new proof-of-concept study shows. The newly developed test (TAM-TB assay) is the first reliable immunodiagnostic assay to detect active tuberculosis in children. The test features excellent specificity, a similar sensitivity as culture tests in combination with speed of a blood test. The promising findings are a major advance for the diagnosis of tuberculosis in children, particularly in tuberculosis-endemic regions.

The study has been published on Sept 1st, 2014 in *Lancet Infectious Diseases*.

Tuberculosis (TB) in children is a serious public health problem especially in low-resource countries. About one million children per year develop [tuberculosis](#) worldwide. Unfortunately, the diagnosis of paediatric TB poses a major challenge. TB symptoms in children are often non-specific and similar to those of common paediatric illnesses, including pneumonia and malnutrition. Further, obtaining adequate respiratory specimens for direct mycobacterial confirmation is problematic. Consequently, there is an urgent need for a more precise, rapid and affordable

[diagnostic test](#) for childhood tuberculosis.

The new so-called TAM-TB assay is a sputum-independent [blood test](#). It makes use of an immunological phenomenon during tuberculosis disease: During an active infection, the expression of CD27 – a surface marker expressed on mycobacteria specific CD4+ T cells – is lost. Using standard intracellular cytokine staining procedures and polychromatic flow cytometry, the [test](#) result is available within 24 hours after blood sampling.

New blood test assessed in tuberculosis endemic regions in Tanzania

The new test was assessed in tuberculosis endemic regions in Tanzania at the Ifakara Health Institute and the NIMR Mbeya Medical Research Center. Sputum and blood samples were obtained from children with tuberculosis symptoms to compare the performance of the new assay with culture tests. For the assessment of the diagnostic performance of the new test, the children were assigned to standardized clinical case classifications based on microbiological and clinical findings. The test proved to have a good sensitivity and excellent specificity.

"This rapid and reliable test has the great potential to significantly improve the diagnosis of [active tuberculosis](#) in children " says TB CHILD Program Manager Klaus Reither from the Swiss Tropical and Public Health Institute (Swiss TPH), who coordinated the study.

In a collaborative effort between Swiss TPH and Ludwigs-Maximilians-Universität München (LMU Munich), the test will now be further refined to optimise performance, particularly in HIV-infected [children](#), and to reduce costs. The goal is to finally validate and implement a rapid, robust and accurate diagnostic test for active paediatric tuberculosis that can be used on the district level in resource-poor, tuberculosis-endemic countries.

More information: Assessment of the novel T-cell activation marker–tuberculosis assay for diagnosis of active tuberculosis in children: a prospective proof-of-concept study. Damien Portevin, Felicien Moukambi, Petra Clowes, Asli Bauer, Mkunde Chachage, Nyanda E Ntinginya, Elirehema Mfinanga, Khadija Said, Frederick Haraka, Andrea Rachow, Elmar Saathoff, Maximilian Mpina, Levan Jugheli, Fred Lwilla, Ben J Marais, Michael Hoelscher, Claudia Daubenberger, Klaus Reither, Christof Geldmacher. Published online, Sept 1 2014, [dx.doi.org/10.1016/S1473-3099\(14\)70884-9](https://doi.org/10.1016/S1473-3099(14)70884-9)

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