

One day instead of seven: a validated tool speeds up TB treatment initiation for children living with HIV

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Tuberculosis is the leading infectious killer of children living with HIV, yet it is notoriously hard to diagnose — and most children who die from it were never started on treatment. In 2024, an estimated 25,000 children with HIV died of TB worldwide. Now, in the first multicountry prospective study of its kind, researchers from the TB-Speed consortium (Côte d'Ivoire, Mozambique, Uganda, Zambia and France) have shown that a simple scoring tool — the **PAANTHER treatment decision algorithm** — can identify children with TB and move them onto treatment in a median of just one day, compared with seven days in earlier work. The results published in **The Lancet Global Health** suggest that the PAANTHER algorithm could support earlier treatment decisions and contribute to reducing missed tuberculosis diagnoses in children living with HIV.

Senior/coordinating author (Olivier Marcy, University of Bordeaux): "This is the first time a treatment decision algorithm for children has been prospectively validated across several countries. It provides the evidence the World Health Organization (WHO) has been asking for, and it brings us closer to putting a validated, practical diagnostic tool into the hands of frontline clinicians."

A vulnerable population in urgent need of better diagnostic tools

Children living with HIV are at high risk of developing severe tuberculosis disease and of dying from tuberculosis if diagnosis and treatment are delayed. However, tuberculosis diagnosis in children remains difficult. Young children often cannot produce sputum, the bacterial load is frequently low, and symptoms may overlap

with other childhood illnesses. These challenges are even greater in children living with HIV, whose clinical presentation may be atypical and whose underlying immunodeficiency can make symptom-based diagnosis less reliable. In many high-burden and resource-limited settings, clinicians must often make treatment decisions despite limited access to microbiological confirmation.

To address this gap, the PAANTHER treatment decision algorithm was developed to help clinicians identify children living with HIV who are likely to have tuberculosis and who should be started on treatment.

The TB-Speed HIV study

The TB-Speed HIV study is a prospective diagnostic cohort study conducted in seven tertiary hospitals in Côte d'Ivoire, Mozambique, Uganda and Zambia. It enrolled 277 children living with HIV, aged from 1 month to 14 years, who presented with presumptive tuberculosis. Children were assessed using a combination of clinical symptoms, chest radiography, abdominal ultrasound, and Xpert MTB/RIF Ultra testing on respiratory and stool samples.

The PAANTHER algorithm provides a score based on these clinical, microbiological and imaging findings. Originally developed within the [ANRS 12229 PAANTHER 01 study](#), conducted in Burkina Faso, Cambodia, Cameroon and Vietnam, it was designed to support tuberculosis treatment decisions in children living with HIV and presenting with presumptive tuberculosis. A score of 100 or above prompted tuberculosis treatment initiation.

Main results

Among the 277 children enrolled in the study, the PAANTHER algorithm showed high feasibility in hospital settings: clinicians calculated a score for 275 children (99.3%), and 272 children (98.9%) had a complete score. The algorithm met the pre-defined validation criteria, with a negative predictive value of 93.3% (95% CI: 84.1–97.4), sensitivity of 97.4% (95% CI: 93.6–99.0), and specificity of 47.5% (95% CI: 38.7–56.4).

The study also showed that the algorithm could support rapid treatment decisions. Tuberculosis treatment was initiated in 197 children (71.1%) at a median time of one day after inclusion, including 185 of the 215 children with a positive score (86.0%). These findings show that the PAANTHER algorithm could be applied by clinicians in real hospital settings and support early treatment initiation in children living with HIV and presumptive tuberculosis.

Lead/corresponding author (Celso Khosa, INS): "For a child living with HIV, every day of delay can make the difference between recovery and death. What this study shows is that clinicians in real hospitals, not just on paper, can use this tool to make a confident treatment decision in about a day."

A step towards better decision-making for childhood TB and HIV

This first multicountry prospective external validation study provides important evidence on the feasibility and diagnostic performance of the PAANTHER treatment decision algorithm in children living with HIV.

The results support the potential role of validated treatment decision algorithms to improve tuberculosis diagnosis and guide treatment decisions in high-burden settings where diagnostic capacity is limited. Further research will be needed to assess how the algorithm can be implemented at lower levels of healthcare and supported by digital clinical decision tool

References

Link to publication:

[https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(26\)00174-9/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(26)00174-9/fulltext)

About the TB-Speed HIV study team

The study involved major clinical and research partners in **Côte d'Ivoire** — Programme PAC-CI, Treichville and Cocody University Teaching Hospital; **Mozambique** — Instituto Nacional de Saúde, Maputo Central Hospital and José Macamo General Hospital; **Uganda** — Epicentre Mbarara Research Centre and Regional reference Hospital Mbarara; and **Zambia** — University of Zambia School of Medicine, University Teaching Hospital and Arthur Davison Children's Hospital.

The TB-Speed HIV study was funded by **Unitaid** and coordinated by the University of Bordeaux, in collaboration with TB-Speed consortium partners (French national research institute for sustainable development – IRD, SOLTHIS NGO).

More about the TB-Speed project

TB-Speed is a research program funded by Unitaid aiming at reducing childhood mortality due to TB by developing, testing, and delivering an innovative, decentralised, cost-effective, and feasible childhood TB diagnostic strategy to increase case finding in children. This research project is implemented in seven countries in sub-Saharan Africa and South-East Asia. It includes several studies testing different diagnostic approaches in specific paediatric populations at risk of tuberculosis or settings. TB-Speed is coordinated by the University of Bordeaux.

<https://www.tb-speed.com/>

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