IMPROVING DIAGNOSIS OF TB IN CHILDREN WITH SEVERE PNEUMONIA, HIV, SEVERE ACUTE MALNUTRITION

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Annual meeting of the Child and Adolescent TB working group
Wednesday 30 October 2019
TB-Speed project – the overall approach

- **Objective:** Develop a feasible and cost-effective childhood TB diagnosis strategy
  - Innovative diagnosis tools
  - Decentralization
  - Specific approaches for vulnerable children: severe pneumonia, HIV-infection, severe acute malnutrition (SAM)
    - Lower sensitivity of clinical diagnosis
    - Higher mortality rate
    - Higher risk of under-diagnosis

- **Work-packages**
  - Operational/implementation research and clinical studies
  - Technical work packages (sample optimization, cost-effectiveness)

- **Diagnostic tools/approaches**
  - Systematic screening and strengthened clinical skills
  - Specific tools/algorithms for children with HIV / SAM
  - Microbiology: Xpert Ultra with G1 Edge on NPA and stools
  - Digitalized X-ray with simplified reading tool
TB-Speed Pneumonia study

- **Objective:** Impact of systematic molecular TB detection on 12-week mortality of children under 5 years with WHO-defined severe pneumonia

- **Intervention:** Xpert Ultra on 1 NPA and 1 stool sample, added to the WHO-SOC (+ immediate anti-TB treatment initiation)

- **Design & settings**
  - Cluster randomized trial of 15 hospitals
  - Cambodia, Cameroun, Côte d'Ivoire, Mozambique, Uganda, Zambia

- **Progress**
  - Since March 2019: 1209 (of 3780) children enrolled
  - 6 hospitals switched to intervention

- **Timelines**
  - Last visit of last patient: December 2020
TB diagnosis in HIV+ children

PAANTHER TB treatment decision algorithm

- **ANRS 12229 PAANTHER study**
  - Burkina Faso, Cambodia, Cameroon, Vietnam

- **HIV+ children with presumptive TB**

- **TB treatment decision score**
  - Based on:
    - contact history
    - clinical features
    - Xpert on NPA and stools
    - CXR
    - abdominal ultrasound
  - TB treatment if score >100

- **Diagnostic performance**
  - Sensitivity: 89% (95%CI 84–93)
  - Specificity: 61% (95%CI 53–69)

**TB-Speed HIV: external validation**

- Côte d'Ivoire, Mozambique, Uganda, Zambia
- Results Q2/3 2021

# TB-Speed HIV study and TB-Speed SAM study

<table>
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<th>TB-Speed HIV study</th>
<th>TB-Speed SAM study</th>
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<td><strong>Objectives</strong></td>
<td><strong>External validation</strong> of the PAANTHER algorithm</td>
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<td><strong>Design</strong></td>
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<td><strong>Population</strong></td>
<td>550 HIV+ children with presumptive TB</td>
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<td><strong>Diagnostic tests</strong></td>
<td>Xpert Ultra done on NPA, stool, sputum&lt;br&gt;Contact history and clinical features&lt;br&gt;CXR and abdominal ultrasonography&lt;br&gt;CRP, Monocytes-Lymphocytes Ratio (+ Quantiferon in children with SAM)&lt;br&gt;Biobank (plasma, urine) for future biomarker studies</td>
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<td><strong>Diagnosis</strong></td>
<td>PAANTHER algorithm</td>
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<td><strong>Study Sites</strong></td>
<td>Côte d’Ivoire, Mozambique, Uganda, Zambia</td>
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Other TB-Speed studies/work packages

- **TB-Speed Decentralization** study
  - Feasibility, impact, cost effectiveness of decentralizing TB diagnosis at PHC versus district hospital

- **TB-Speed Stool Processing**
  - Testing a simplified stool processing method for use at PHC level (+ FIND stool processing kit and KNCV One-Step method)

- **NPA**
  - Developing a low cost low-pressure aspiration device

- **TB-Speed TB-PK**
  - Evaluating pharmacokinetics (PK) and optimised dosages of TB drugs in children with SAM
TB-Speed at the 2019 Union Conference

- Availability and accessibility of TB diagnostic services for pediatric TB at the primary healthcare level: a multicountry survey
  Thursday 31st, October 2019 / 14h00-15h30 - SP-12-C4 / Eric Wobudeya (MU-JHU, Uganda)

- Development of a simple stool processing method for diagnosis of intra-thoracic pediatric tuberculosis using GeneXpert MTB/RIF Ultra testing: results of an in vitro study
  Saturday 2nd, November 2019 / 14h00-15h30 - SOA-17-C10 / Manon Lounnas (IRD, France)

- Childhood TB diagnostic capacities in primary health care facilities in high TB burden countries: results from the TB-Speed cross-sectional descriptive survey
  Saturday 2nd, November 2019 / 12h45-13h45 - PS-41-C4 / Eric Wobudeya (MU-JHU, Uganda)

- Healthcare professionals' perceptions on barriers and facilitators to childhood tuberculosis diagnosis in Côte d’Ivoire and Mozambique
  Saturday 2nd, November 2019 / 12h45-13h45 - PS-41-C4 / Joanna Orne-Gliemann (University of Bordeaux, France)
FUNDING & SUPPORT

THIS PROJECT IS MADE POSSIBLE THANKS TO THE FUNDING OF

**Unitaid**
Innovation in Global Health
Switzerland - www.unitaid.org

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**INITIATIVE 5%**
Sida, Tuberculose, Paludisme
France - www.initiative5percent.org

THIS PROJECT BENEFITS FROM THE SUPPORT OF

**ANRS**
Agence Nationale de Recherche sur le Sida et les Rêvèrances
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MINISTRY OF HEALTH, NATIONAL TB PROGRAMS, NATIONAL HOSPITALS AND INSTITUTES OF CAMBODIA, CAMEROON, COTE D’IVOIRE, MOZAMBIQUE, SIERRA LEONE, UGANDA, ZAMBIA