

**MAKERERE UNIVERSITY**

**DIAGNOSTIC ACCURACY OF THE GENEXPERT SYSTEM AMONG CHILDREN  
WITH PULMONARY TUBERCULOSIS AT MULAGO HOSPITAL**

**BY**

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## ABSTRACT

### Background

The GeneXpert system is a rapid mycobacteria tuberculosis diagnostic tool which has shown higher sensitivity and was validated for use in children based on successful data among the adult population. This study aimed to determine the diagnostic accuracy of the GeneXpert system and describe clinical characteristics associated with a positive test among children using sputum culture as the gold standard diagnostic tool.

### Methods

Children aged 2 months to 12 years with suspected pulmonary tuberculosis and fulfilled the study eligibility criteria were consecutively enrolled into a cross-sectional diagnostic study at the Mulago National Referral Hospital in Uganda. The enrolled children had a clinical examination, HIV testing, complete blood count, tuberculin skin test, chest radiography, and sputum induction.

### Results

A total of 250 children with a median age of 36 months (IQR 16 – 72) were enrolled and 41.6% were HIV positive. Forty one children (16.4%) had a positive sputum culture while 14% had a positive GeneXpert test. The GeneXpert test had a sensitivity of 70.7% (CI 54.3-83.4) and a specificity of 97.1 % (CI 93.6-98.8). The test identified 14 of 15 (93.3% CI 66.0-99.7) smear positive culture positive cases and 15 of 26 (57.7% CI 37.2-76.0) smear negative culture positive cases. The overall Positive Likelihood Ratio (LR+) for the GeneXpert test was 24.6 (CI 10.9-55.5) while the Negative Likelihood Ratio (LR-) was 0.30 (0.19- 0.49). A positive GeneXpert test was independently associated with age > 5years (OR 4.3; CI 1.74- 10.60, p value 0.002), positive history of TB contact (OR 2.56; CI 1.11-5.88, p value 0.03), and a positive tuberculin

skin test (OR 0.2; CI 0.08-0.52, p value 0.001). The results of the GeneXpert were available within a day of running the test compared to culture which took 42 to 56 days.

### **Conclusion**

The GeneXpert test is a useful rapid diagnostic tool in the management of children with suspected pulmonary tuberculosis but it did not increase sensitivity beyond that demonstrated with the culture method. Age > 5 years and a positive history of TB contact were positively associated with a positive GeneXpert test while a positive TST was negatively associated with a positive GeneXpert test.