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A laboratory-initiated AFB smear protocol for respiratory samples that reduces waste and saves manpower cost

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Background

While World Health Organisation now recommends molecular methods as the initial diagnostic test for pulmonary TB and rifampicin resistance, many healthcare institutions continue to rely on conventional AFB smears for contact tracing and healthcare worker exposure management. This is despite Xpert® MTB/RIF Ultra (Xpert TB)'s superior sensitivity over microscopy, studies which show robust correlation between Xpert TB and AFB smear grading, and the labour-intensive nature of AFB smear preparation.

Methods

Between November 2024 to April 2025, all respiratory samples with a positive TB PCR by Xpert TB in our laboratory would have an AFB smear performed as a reflex test. Conversely, respiratory samples with a negative Xpert TB would not undergo AFB smear or have its AFB smear request cancelled if ordered.

Results

A total of 253 AFB smear requests from respiratory samples were received during the study period, where 172 (68%) were TB PCR-negative. Based on the proposed algorithm, 128 PCR-negative samples were excluded from AFB smear testing, while 44 were still tested due to workflow lapses such as staff unfamiliarity. All 44 AFB smears were negative, consistent with PCR results, demonstrating the redundancy of these tests. This workflow saved approximately 2,048 minutes of man-time related to smear processing and reading, resulting in significant cost and labour efficiencies.

	AFB no.	Rejection (%)	Man-time (minutes)
Rejected based on evaluation workflow:	172	68	-
• Actual rejection	128	-	2048
• Not rejected due to workflow lapse	44	-	704

Conclusions

While complete elimination of AFB smears in favour of TB PCR for infectivity assessment remains ideal, our protocol of reflex AFB smear testing only for PCR-positive respiratory samples serves as an effective compromise. This approach reduces waste and enables significant cost savings while providing infection control teams with necessary information for contact tracing decisions.