In many high TB burden settings, sputum-smear microscopy remains the primary diagnostic tool for evaluating individuals presenting with signs and symptoms of TB. However, sputum-smear microscopy has a low sensitivity up to approximately 50% among people living with HIV *(34, 35)*, who often have difficulty in producing sputum or have paucibacillary sputum. The sensitivity will vary with the setting and as well as with the degree of immunosuppression of the individual. Furthermore, sputum-smear microscopy cannot distinguish drug-susceptible strains from drug-resistant strains. WHO recommends that TB programmes transition to replacing microscopy as the initial diagnostic test with mWRDs that detect *Mycobacterium tuberculosis (M. tuberculosis)* complex bacteria (MTBC). The *WHO standard: universal access to rapid tuberculosis diagnostics* includes two benchmarks relating to access to mWRDs as an initial diagnostic test, including one that requires the use of mWRD as an initial diagnostic test, combined with urinary LF-LAM, for people living with HIV *(26)*.

2.2.2 Summary of evidence and rationale

Recommendation 8: use of molecular WHO-recommended rapid diagnostic tests

mWRDs incorporate a growing number of different products that detect *M. tuberculosis* genetic material in samples. Most mWRDs detect rifampicin resistance, while some also detect isoniazid resistance. Table 2.7 summarizes the evidence on the accuracy of the different tests in the diagnosis of TB in people living with HIV.

Table 2.7 Diagnostic accuracy of mWRDs for TB diagnosis in people living with HIV compared with microbiological reference standard

mWRD test	No. of studies (no. of participants)	Sensitivity and specificity	Certainty of evidence
Xpert® MTB/RIF for pulmonary TB	14 (1159) 14 (3505)	Se: 0.81 (95% CrI: 0.75–0.86) Sp: 0.98 (95% CrI: 0.97–0.99)	High High
Xpert Ultra for pulmonary TB	2 (149) 2 (430)	Se: 0.88 (95% CrI: 0.74–0.94) Sp: 0.95 (95% CrI: 0.79–0.96)	Low High
TB-LAMP for pulmonary TB	5 (370)	Se: 0.64 (95% CI: 0.49–0.76)[a] Sp: 0.99 (95% CI: 0.85–0.999)[a]	Very low Very low
Xpert® MTB/RIF blood	1 (9) 1 (65)	Se: 0.56 (95% CI: 0.21–0.86) Sp: 0.94 (95% CI: 0.85–0.98	Very low Very low

[a] TB loop-mediated isothermal amplification (TB-LAMP) in people living with HIV was assessed according to two mycobacterial culture reference standards. The pooled sensitivity ranged from 0.64 (0.49–0.76) to 0.73 (95% CI: 0.52–0.88) and the pooled specificity ranged from 0.95 (95% CI: 0.64–0.995) to 0.99 (0.8–0.999).

In 2011 WHO first recommended the use of Xpert MTB/RIF, as the initial diagnostic test using sputum for pulmonary TB in individuals suspected of MDR-TB or HIV-associated TB *(36)*. This strong recommendation was updated in 2013, based on high-quality evidence and increased accuracy, recommending that Xpert MTB/RIF should be used rather than conventional microscopy, culture and drug-susceptibility testing, as the initial diagnostic test in adults suspected of having MDR-TB or HIV-associated TB *(36)*. Since 2020, WHO has recommended a number of mWRDs for the initial diagnosis of TB, instead of smear microscopy, for all people being evaluated for pulmonary and extrapulmonary TB, regardless of HIV status *(37)*.