

Alternative methods of smear collection are effective at diagnosing TB

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Two studies by a team of researchers led by Luis E. Cuevas and Mohammed Yassin from the Liverpool School of Tropical Medicine and jointly coordinated with Andrew Ramsay at WHO-TDR Special Programme for Research and Training in Tropical Diseases are published in this week's *PLoS Medicine*. The studies have important implications for the ways in which diagnosis for the endemic infectious disease, tuberculosis (TB), can be done in poor countries. One study suggests that less sputum tests collected the same day of consultation are needed and the other suggests that a faster laboratory test can be used while maintaining the same level of accuracy for diagnosis. Both studies show that alternative, less labour-intensive tests that are more convenient for patients could be effectively used in poorer countries.

The researchers enrolled 6627 patients in Ethiopia, Nepal, Nigeria and Yemen who had had a cough for more than two weeks (a characteristic symptom of tuberculosis).

In the main trial the centers participating in the study were randomly assigned each week for a year to use different methods of sputum collection. The results suggest that a sputum collection scheme in which two samples are collected one hour apart followed by a morning specimen could identify as many smear-positive patients as the standard "spot-morning-spot" scheme in which patients provide an on-the-spot specimen during their initial consultation, a specimen collected at home the next morning, and another on-the-spot specimen when they bring their morning specimen to the clinic. The study also confirmed that

examination of the first two specimens alone identifies most smear-positive patients, independently of which scheme is used.

The authors say: "The identification of the majority of smear-positive patients may require no more than one patient visit, and the scheme presented here has the potential to improve the diagnosis of [pulmonary tuberculosis](#) in Low and [Middle-Income Countries](#). A single-visit diagnosis would represent a substantial opportunity to improve the delivery of TB services, particularly to the poor."

In the second study, which is a sub-study of the main trial, the researchers examined nearly 2,400 patients to show that a faster [laboratory test](#), a variant form of smear microscopy—light emitting-diode fluorescence microscopy (LED-FM)— could identify more people with tuberculosis than the standard smear microscopy test (in which technicians use a stain called Ziehl Neelsen from a patient's sputum). However LED-FM might also lead to more people without tuberculosis being needlessly treated, as this test picks up more false positives, that is, people who don't have TB but who are incorrectly classified as test-positive for the disease.

The authors conclude: "This study has shown that LED-FM can play a key role in reaching the [World Health Organization] targets for TB detection, reducing laboratory workloads, and ensuring poor patients' access to TB diagnosis and prompt treatment."

More information: Cuevas LE, Yassin MA, Al-Sonboli N, Lawson L, Arbide I, et al. (2011) A Multi-Country Non-Inferiority Cluster Randomized Trial of Frontloaded Smear Microscopy for the Diagnosis of Pulmonary Tuberculosis. PLoS Med 8(7): e1000443.

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